Global Veterinaria 22 (5): 267-272 2020
ISSN 1992-6197
© IDOSI Publications, 2020
DOI: 10.5829/idosi.gv.2020.267.272

The Saga of Macrominerals and its Role in Reproduction in Domestic Animals: A Review

[1]Rajesh Kumar, [2]R.P. Diwakar, [3]H.C. Verma, [4]Anand Kumar,
[5]Pramod Kumar, [6]K.D. Singh and [2]Vibha Yadav

[1]Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India
[2]Department of Veterinary Microbiology, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[3]Department of Veterinary & Animal Husbandry Extension Education,
C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[4]Department of Veterinary Gynaecology & Obstetrics,
Ranchi Veterinary College, B.A.U., Kanke, Ranchi-06, Jharkhand, India
[5]Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[6]Department of ILFC, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India

Abstract: A number of inorganic elements are essential for the growth, production and reproduction of animals. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Key words: Domestic Animals · Macrominerals · Production · Reproduction

INTRODUCTION

A number of inorganic elements are essential for the growth, production and reproduction of animals [1]. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. The inorganic elements are classified according to their requirements in animal body. Those required in greater quantities are referred as macrominerals (calcium. phosphorus, sodium, chloride, potassium, magnesium and sulfur). Macrominerals required in large amount each day and their concentration in diet is expressed as percentage of diet or in grams per kilogram of diet. Macrominerals has role in different physiological functions. Other elements required in much smaller amounts are referred as trace minerals (microminerals) i.e. copper, cobalt, iodine, iron, manganese, molybdenum, selenium, zinc, chromium and fluorine. Their concentration in diet is expressed as parts per million (ppm), which is equivalent to milligram per kilogram of diet or in some cases as parts per billion (ppb), which is equivalent to microgram per kilogram of diet. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Role of Various Macro Minerals in Animal Reproduction

Calcium (Ca): Calcium is an essential component of skeleton and plays a pivotal role in maintaining homeostasis of vertebrates [2]. The maximum portion of calcium present in the bone as hydroxyapatite (99%) and small fractions present in the cell membrane or endoplasmic reticulum (0.9%), extracellular fluid or serum (0.1%) and in cytosol (0.00002%) [3]. Extracellular calcium exist in three forms i.e. ionized (50%), complexes to anions (5%) such as citrate, bicarbonate, phosphate, or lactate and protein bound (45%). Ionized calcium involved in array of physiological processes such as muscular

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India.

RESEARCH ARTICLE

Impacts of Stocking Density on Broiler Chicken Performance Stress Reaction and Mortality in Broiler Chicken

Pankaj Chauhan[1], Kunwar Dhananjay Singh[2*], Partha Sarathi Pramanik[3], Subodh Kumar[4], Ashish Kumar Srivastav[5], Krishna Kant Tripathi[6], Durgesh Nandan[7]

Abstract

The present study investigated the effect of stocking density on growth performance, stress reaction, and mortality in broiler chickens. Two hundred and forty (240) day-old straight run commercial broiler chicks (Vencob) were divided into two batches having 120 chicks each and further subdivided into three equal groups (G1, G2, G3) representing different stocking densities (20, 25, and 30-meter square/bird) having 40 chicks in each group. It was evident that, after the 2nd week, body weight gain of G3 group was significantly ($p<0.01$) higher than G2 and G1. In 4th week, body weight gain of G2 and G3 groups was significantly ($p<0.01$) higher than G1. After completion of 35 days of the trial, the last week's body weight gain of G2 (577.15 ± 28.78 g) was found significantly ($p <0.01$) higher than G1 (554.07 ± 28.78 g) and G3 (517.35 ± 28.78 g). During 1st week, the FCR of broiler chicken of G1 (1.96 ± 0.02) group was found to be significantly ($p <0.01$) higher than G2 (1.83 ± 0.02) and G3 (1.82 ± 0.02). During 3rd week, FCR of G1 (1.94 ± 0.02) group was significantly ($p<0.01$) higher, while at 4th week, the FCR of G3 (1.81 ± 0.03) was found significantly ($p<0.01$) higher than other groups. The least square means of H/L ratio were significantly higher in G1 and G3 groups as compared to the G2 group. During the experimental period, 2.5 % mortality was observed in G1 and G2 groups, whereas 5% in group G3.

Keywords: Body weight, Body weight gain, Broilers, Feed conversion ratio, and Heterophil-lymphocyte ratio.

Ind J Vet Sci and Biotech (2022): 10.48165/ijvsbt.18.4.08

Introduction

The poultry sector in India has valued at about Rs. 80,000 crores (2015-16), which is broadly divided into two sub-sectors – one with a highly organized commercial sector with about 80% of the total market share of Rs. 64,000 crore and the other being unorganized with about 20% of the total market share of Rs. 16,000 crore (National Action Plan for Egg and Poultry-2022). Broiler farming is a practicable business activity and has a huge scope for growth in India. The poultry industry is about Rs. 600 billion, about 0.77 % of the national GDP and 10 % of the livestock GDP of over five million people in the country (CARI vision 2050, 2013). Modern broiler houses are managed in extreme controlled environment. Birds should be provided with proper ventilation, temperature, and humidity at higher densities. Increasing stocking density without adversely affecting growth performance, feed conversion, meat quality, and welfare is a management technique used to reduce labor, housing, fuel, and equipment costs. With higher stocking densities, the profit per chicken decreases. The total production of meat per unit of floor surface increases, which results in higher profit. However, most farmers do not know adequate stocking density (Muniz *et al.*, 2006; Adebiyi *et al.*, 2011).

Stocking density is very important in broiler production (Tablante *et al.*, 2003). In an earlier study, feed conversion ratio, feed intake, and body weight gain were increased at high stocking density (Estevez, 2007). Environmental temperature, humidity, and ammonia concentration can all disturb broiler growth (Yi *et al.*, 2016; Zhou *et al.*, 2019). The effect of stocking density on feed conversion ratio and mortality has remained a debatable issue (Singh *et al.*, 2018). A decrease in growth performance and survivability of broiler chickens after an increase in ambient temperature has already been recognized (Gous and Morris 2005). Singh *et al.* (2017) recorded a higher frequency of foot pad lesions with higher stocking density in broiler chickens. When stocking density increases, it causes physiological stress in the birds. Stress causes the release of hormones and reorients the

[1,3,7]Department of Livestock Production & Management, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[2,4,5]Department of Livestock Farm Complex, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT),, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[6]Department of Veterinary Pathology, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

Corresponding Author: Kunwar Dhananjay Singh, Department of Livestock Farm Complex, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya-224229, Uttar Pradesh, India., e-mail: kd.vet007@gmail.com

How to cite this article: Chauhan, P., Singh K.D., Pramanik, P.S., Kumar, S., Srivastav, A.K., Tripathi, K.K., & Nandan, D. (2022). Impacts of Stocking Density on Broiler Chicken Performance. Ind J Vet Sci and Biotech. 18(4), 36-39.

Source of support: Nil

Conflict of interest: None.

Submitted: 23/03/2022 **Accepted:** 25/07/2022 **Published:** 10/09/2022

© The Author(s). 2022 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

The Pharma Innovation Journal 2021; SP-10(6): 210-214

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(6): 210-214
© 2021 TPI
www.thepharmajournal.com
Received: 01-04-2021
Accepted: 03-05-2021

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Subodh Kumar
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Srivastav
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Veterinary Pharmacology & Toxicology, College of Veterinary Science and Animal sciences, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author:
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of stocking density on gait score and mortality in broiler chickens

KD Singh, PS Pramanik, Subodh Kumar, Rajesh Kumar, AK Srivastav and MK Verma

Abstract
The research was conducted to investigate the impact of stocking density (i.e., I.C.A.R., Venky's and Amrit recommendations) on gait score & mortality in broiler chickens. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches. Each batch was subdivided in 3 equal groups namely Gr 1 (I.C.A.R.), Gr 2 (Venky's) and Gr 3 (Amrit). All the birds were raised on pucca floor with saw dust as litter material providing equal managemental practices. Walking ability was accessed at weekly interval up to 6 weeks of observation. The gait scoring system followed in the present study was Modified gait scoring system developed by Garner *et al*. (2002). Daily mortality of birds was recorded in morning hours &mortality rate was calculated weekly. The lowest and highest% of birds showing GS 0 under I.C.A.R. recommendation of stocking density have been found to be 83.93±0.64% (week 4) and 92.86±0.40% (week 6) respectively. Similarly the corresponding proportion of birds showing GS 1 were 6.07±0.78% (week 1) and 13.93±0.64% (week 4) respectively. Comparatively lesser % of birds show GS 2 and the lowest and highest L.S. means % of this were 0.00±0.40% (week 6) and 3.21±0.82% (week 3) respectively. Venky's & Amrit's observation were also similar as I.C.A.R. recommendation has been observed. Overall it has been observed that% of birds showing GS 0 was significantly more in I.C.A.R. followed by Amrit and Venky's during this study. However, highest% of birds showing GS 1 was recorded in Venky's recommendation followed by Amrit and I.C.A.R. Whereas, less than 5% birds exhibited GS 2 in this study in respective of stocking densities. There was no significant difference regarding% of birds with GS 2 in three stocking densities during all the weeks except at week 4. The overall mortality (%) was less than 5% over weeks under each placement densities. No significant difference was observed among mortality rates of broiler chickens under these three stocking densities during all the weeks studied. From present study, this can be concluded that leg health and walking ability was comparatively better under I.C.A.R. recommendation followed by Amrit and Venky's. However, effect of stocking density on mortality was non significant among three stocking.

Keywords: gait score, foot pad lesions, stocking density, mortality and walking ability

Introduction
The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012) [21]. Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.57 percent and 11.44 percent in egg and broiler production, respectively. The value of output from the poultry sector was US$10 billion in 2014 (Rajendran *et al*., 2014) [25]. Broiler production has been more vibrant than layer production within the poultry sector, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (Index Mundi, 2015) [15]. India is the fourth largest producer of poultry meat in the world, valued at US$ 6.6 billion. Poultry production accounts for about 0.66 percent of India's GDP and 7.72 percent GDP from the livestock sector (Rajendran *et al*., 2014) [25]. Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014. The per capita availability of poultry meat is 2.8 kg; against recommended level of 11 kg (Rajendran *et al*. 2014 [25]; Index Mundi, 2015 [15]). The main reasons for improved broiler poultry production (Kalamkar, 2012; SAPPLPP, 2009) [17, 29] are: modernization of production practices; import of pure lines/grandparent stock; least-cost feed formulation; vaccines against major diseases; provision of EAS and other input services; improved quality breeder management; developments in poultry processing; and private sector partnerships through Contract Broiler Farming. It is estimated that 37 percent of broiler production in India is under contracts, and about 78 percent of those contracts are concentrated in southern India (Rajiajwani, 2012) [26].
Gait scores (GS), a parameter used to evaluate walking ability (Kestin *et al*., 1992; Garner *et*

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 88-92
© 2020 JEZS
Received: 10-01-2020
Accepted: 12-02-2020

VN Gupta
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

P Gautam
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

B Singh
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

G Pandey
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

D Nandan
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
VN Gupta
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of different litter materials on growth performance of broiler chickens

VN Gupta, PS Pramanik, KD Singh, S Gautam, P Gautam, B Singh, G Pandey and D Nandan

Abstract
Two hundred forty day old Vencobb 400 straight run commercial broiler chicks were randomly divided into three groups with two replicates of 40 chicks in each to assess the effect of different litter materials on growth performance of broiler chickens. The broiler chicks were kept on rice husk, 50 % rice husk + 50 % paddy straw and wood saving in Tc, T_{MIX} and T_{WS} groups, respectively for a period of 42 days. The results of the experiment showed that broiler chicks kept under T_{mix} (3027.20^{b}±80.50g) i.e. combinations of paddy straw with rice hulls were heavier as compared to the other litter treatments. The overall body weight gain was numerically higher in T_{mix} as compared to the other litter treatments. It was also evident that feed intake was higher in T_c groups as compared to T_{MIX} and T_{WS} groups. The overall FCR was superior in T_{mix} group (1.84^{a}±0.21) as compare to other group T_{ws} (2.22^{ab}±0.15) and T_c (2.42±0.11). The results of the present experiment concluded that the growth performance indicated that final body weight, body weight gain, FCR were better in T_{mix} group than wood saving and the control group broiler birds however, feed intake was higher in T_c group.

Keywords: litter materials, paddy straw, rice hulls, broiler chicken

Introduction
The Poultry industry has emerged as the fastest growing segment of the livestock sector both globally as well as in India (Iisa Augustine and Ruchira Shukla, 2015) [7]. Now a days poultry meat is available for huge groups of consumers due to revolutionary mechanization of the poultry sector in recent years. The higher nutritional, sensory and economical characteristics of poultry meat have made it, far most famous animal food product globally. It has a high potential to generate foreign exchange earnings through export of poultry products to neighboring countries (Iisa Augustine and Ruchira Shukla, 2015) [7]. Broiler production is one of the most dynamic and fastest growing animal husbandry sub-sectors in India. The total poultry population has increased by 16.81% over in the recent census and the total poultry in the country is 851.81 million. However, in previous census 2012 it was 729.21 million in numbers (Livestock census, 2019) [12]. Due to increasing population growth, rising income and urbanization there is an increasing demand of animal protein source so that chicken meat has shown its fastest growth in last two decades.

The type of bedding can affect performance of broiler birds (Billgilli *et al.*, 1999b) [2]. The litter type affects litter bacteria and litter consumption which may influence the immunity and performance of broilers (Lien *et al.*, 1992) [10]. Common bedding materials include rice husk, paddy straw, wood shavings, sawdust, peanut hulls, shredded sugar cane, straw, and other dry, absorbent, low-cost organic materials. Sand is also occasionally used as bedding. The efficiency of litter type can be influence by various factors such as physical properties of the material used, particle size, build up moisture content and rate of caking. In many areas sawdust and wood shavings are most commonly used bedding materials for commercial poultry production. The higher cost, poor supplies and unavailability of these litter materials has encouraged the search for suitable substitute litter materials. Good bedding materials should absorb the moisture from body wastes, limiting the production of harmful pathogenic micro-organisms and ammonia, provide a dry, comfortable medium to broilers for dusting themselves in and rest upon. Therefore, it should be soft, compressible, absorbent and capable of drying quickly.

In this context the use of crop and wood residues as poultry litter seems to be promising. Hence, the present experiment was designed to assess the effect of different litter materials on

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 62-64
© 2020 JEZS
Received: 11-01-2020
Accepted: 13-02-2020

P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Animal Genetics and Breeding, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Verma
Department of Livestock Farm Complex, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Gupta
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

B Singh
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens

P Gautam, PS Pramanik, KD Singh, MK Verma, S Gautam, AK Verma, VN Gupta and B Singh

Abstract
The present experiment was conducted to investigate the impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens. For a period of 42 days study two hundred forty day old Vencobb 400 straight run commercial broiler chicks were randomly divided into three groups with 2 replicates of 40 in each at the poultry unit of livestock farm complex, College of veterinary sciences and animal husbandry, A.N.D.U.A.T. Kumarganj, Ayodhya, (U.P). In first green-blue group (T_{GB}), the birds were kept on green LED light (GL) and blue LED light (BL) from 1-21days and 22-42 days, respectively. The broiler birds of Group T_W and T_C were kept in white and incandescent LED lights for 42 days, respectively. The findings revealed that the heterophil % differed significantly ($P<0.05$) at 6th week of age when broiler finished their light treatment duration (after shifting from green LED to blue LED at 4th week of age). The ratio of blood heterophil to lymphocyte was also significantly differed ($P<0.05$) at the 6th week of age. The H/L ratio was higher in T_C group (0.37±0.008) whereas, it was lowest in T_{GB} group (0.33±0.456) than T_W group (0.35±0.120) birds at 6th of age. This study indicated that birds were minimum stress level in T_{GB} group than other treatment groups. The mortality rate of broiler chicks was highest in T_W group (6.25%) and lowest in T_{GB} group (3.75%) than T_C group (5%) birds. The results of the present study concluded that, broiler birds under green-blue (1-21d in GL and 22-42d in BL) LED bulb treatment group had significantly ($p<0.05$) lower stress as drawn by a ratio of Heterophil: Lymphocyte, which was highest in incandescent bulb treatment groups followed by white LED groups.

Keywords: Monochromatic light, stress reaction, mortality rate, broiler chicken

Introduction
For the large section of poultry meat consumers, the comprehensive mechanization of the poultry segment has made the broiler meat available in the recent years. Now the broiler meat is far most globally famous animal food product due to its nutritional, sensory and economical properties. It has a high potential to generate foreign exchange earnings through export of poultry products to neighboring countries. The Poultry industry has emerged as the fastest growing segment of the livestock sector both globally as well as in India (Iisa Augustine and Ruchira Shukla, 2015) [6]. Broiler production is one of the most dynamic and fastest growing animal husbandry sub-sectors in India. The total poultry population has increased by 16.81% over in the recent census and the total poultry in the country is 851.81 million. However, in previous census 2012, it was 729.21 million in numbers (Livestock census, 2019) [14]. Due to increasing population growth, urbanization and rising income there is an increasing demand of animal protein source so that chicken meat has shown its fastest growth in last two decades.
Lighting is an important environmental cause in poultry production that is known to affect performance and behavior. Chickens are visually well equipped, and therefore light plays very important role in their wellbeing and productivity. Light is constituted of a wide spectrum of electromagnet (EM) waves. The visible part of the electromagnetic (EM) spectrum is relatively small and is formed of wavelengths from approximately 350 to 800 nm. The eyes of broilers seem to be more sensitive to the broader spectrum than humans and these can perceive ultraviolet and infrared as well.

Components of Light in Poultry Management
Artificial light can be described by distribution of light (photoperiod), colour (wave length)

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(4): 203-210
© 2021 TPI
www.thepharmajournal.com
Received: 12-01-2021
Accepted: 22-02-2021

Durgesh Nandan
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Gaurav Pandey
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Yadav
Department of Veterinary Surgery & Radioligy, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on relationship between milk yield and skin thickness of dairy animals

Durgesh Nandan, PS Pramanik, KD Singh, RP Diwakar, Gaurav Pandey and Vipin Yadav

Abstract
The aim of the present investigation was to examine the relationship between skin thickness and milk yield. The experiment was conducted at Livestock Farm Complex, C.V.Sc. & A.H., ANDUAT Ayodhya, Ram Newaj Singh Dairy Farm, Kumarganj, Ayodhya (UP) and Gorakhnath Singh Dairy, Baijnathpur Gorakhpur (UP) as per availability of lactating animals (Murrah buffalo, Gir and Sahiwal cows) which was 32 animals of each breed. A total of 96 dairy animals were studied in this experiment in which 32 Murrah buffaloes, 32 Sahiwal cows and 32 Gir cows ranging from first to fourth lactation periods. The dairy animals were selected on daily milk yield and total milk yield were recorded from the records over an average period of 120 days of lactation length. The skin thickness was measured from seven sites or regions namely neck, chest, abdomen, rump, hind quarter, udder and flank of each animal. The result shows that, in Murrah buffaloes the highest average DMY was 8.16 ± 0.52, 8.62 ± 0.55, 8.29 ± 0.78, 8.15 ± 0.55, 8.69 ± 0.77 and 7.86 ± 0.39 litres by animals under thin skin thickness of neck, chest, abdomen, hind quarter, udder and flank regions respectively. In Sahiwal cows, it was observed that the highest average DMY was 7.26 ± 0.31, 7.47 ± 0.65, 7.63 ± 0.48, and 7.69 ± 0.76 litres by animals under low skin thickness of neck, chest, abdomen and udder regions respectively. Where as in Gir cows it was observed that the highest average DMY was 6.23 ± 0.46, 6.06+0.41, 5.96 ± 0.51, 5.06 ± 0.36 and 6.03 ± 0.65 litres by animals under low skin thickness of neck, abdomen, hind quarter, udder and flank regions respectively. However, it was also observed that all the Murrah buffaloes, Sahiwal and Gir cows having thick skin of different regions were found to produce lowest milk yield per day. Least square analysis showed that the relation between DMY and skin thickness of thin, moderate and thick in different regions was found to be statistically non-significant except in flank regions where different types of skin thickness found significant (p<0.01). Further it was observed TMY and type of skin thickness in different regions were not found significant (p<0.01) except udder and abdomen regions where thick skin TMY were found to be statistically highly significant (p<0.01). It may be concluded that, the udder skin thickness was minimum followed by that in ascending order in the neck, chest, abdomen, hindquarter, flank and rump regions of the animals. Further it was evident that Murrah buffalo, Sahiwal and Gir cows under their skin thickness were found to produce more milk, while moderate skin thickness produced more milk and then thick skin thickness produced milk.

Keywords: Skin thickness, murrah, sahiwal, gir, parity, milk yield

Introduction
Dairying is an important enterprise for many countries of the world. As a result it has been an important source of income generation for rural families in the developing countries. With the increase in human population, the demand for milk has also been increased (Tollens *et al*., 2004) [17]. In India, milch cattle and buffalo breeds like Sahiwal, Gir, Red Sindhi, Deoni, Murrah, Surti, Mehasana etc. Are well adapted to the prevailing environmental conditions. Among all the milch breeds, Sahiwal is considered to be one of the important cattle milch breed and thrives well in many parts of India. Animals of this breed are known for their ability of heat tolerance, disease resistance and adaptability to low input system. The average milk yield of this breed has been reported between 2,725 and 3,175 kg in a lactation period of 300 days and certain individual cows have been reported to produce as high as 4,535 kg of milk (Sastry and Thomas, 2016) [15].
In India, majority of buffalo population belong to the riverine group and the milk production is the main function of these animals. It is reported that about 73.77 % of world buffalo population are found in South Asia. In India, the total buffalo population is recorded 108.70 million and about 51% of total milk production is shared by these animals (Livestock Census, Govt. of India, 2019).

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 55-59
© 2020 JEZS
Received: 07-01-2020
Accepted: 09-02-2020

DK Chaudhari
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Sachin Gautam
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

VK Singh
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Ruma Devi
Department of Livestock Products Technology, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

SP Singh
Department of Livestock Farm Complex, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Tewari
Department of Animal Nutrition, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Rao
C.R.C.U., Department of Animal Husbandry, Ayodhya Mandal, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sachin Gautam
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Influence of herbal mixture, exogenous enzymes and butyric acid supplementation on nutrient digestibility, carcass characteristics and economics of broiler chickens

DK Chaudhari, Sachin Gautam, VK Singh, Ruma Devi, KD Singh, SP Singh, S Tewari and S Rao

Abstract
Three hundred commercial straight run, day old Ven Cobb 400Y chicks were divided into six groups with 5 replicates of 10 birds in each to assess the efficacy of herbal mixture, exogenous enzymes and butyric acid on their performance. The chicks were placed on basal diet with no supplement in negative control (NC) and basal diet supplemented with antibiotics, alcoholic extract of 0.5% herbal mixture, 0.5% herbal mixture (alcoholic extract) + 0.1% butyric acid, 0.5% herbal mixture (alcoholic extract) + 0.03% exogenous enzymes and combination of 0.5% herbal mixture (alcoholic extract) + 0.03% exogenous enzymes + 0.1% butyric acid in PC, HE, HEB, HEE and HEBE groups, respectively. The results of the analyzed data showed that DM and CP digestibility coefficient of herbal based non-antibiotic feed additive groups were similar to NC and PC group birds. Drawn weight yields were not affected by any additive supplements. The abdominal fat was significantly (P<0.005) lower in HEB and HE group birds as compare to NC and PC groups. Profit/bird live weight, benefit cost ratio and profitability of HEB group was significantly (P<0.05) better than NC, but (P<0.05) lower to PC group. It was concluded that, supplementation of alcoholic extract of 0.5% herbal mixture along with 0.1% butyric acid had no adverse effect on nutrient digestibility and carcass characteristics; however, profitability was higher than negative control birds.

Keywords: Herbal mixture, butyric acid, nutrient digestibility, carcass characteristics and economics

Introduction
Now a days poultry sector is one of the most popular and fastest growing livestock sector in India, contributing 10% of livestock and 0.7% of total GDP. The demand for low cost and processed quality chicken meat is growing by 15-20% annually. The aim of poultry production is to get proper growth rate, better feed conversion efficiency and maintaining optimal health to maximize production in terms of meat and egg. In poultry diet, antibiotic growth promoters (AGPs) are used for the protection against some diseases, toxins, improvement in nutrients absorption in intestines etc. However, the efficacy of antibiotics reduced due to development of resistance in pathogenic bacteria; besides this residues of antibiotics in meat have negative impact on public health. In most of the countries AGPs has been either regulated or banned (Lesson *et al*., 2015) [14]. So, there is need of finding alternatives to growth-promoting antimicrobials without affecting their production. Several substances like essential oil of herbs, organic acids, probiotics, prebiotics, exogenous enzymes etc. have been investigated in recent years, which are able to support productive performance and prevent the incidence of some diseases in poultry (Huyghebaert *et al*., 2011) [10].

Phytogenic feed additives are plant derivatives of plant extraxts, herbs and spices with extended activities viz., endogenous secretions in the gut, stimulation of feed intake and better growth. Herbs like aloe vera (*Aloe barbadensis*), ashwagandha (*Withaniasomnifera*), mangrail (*Nigella sativa*), turmeric (*Curcuma longa*), methi/fenugreek (*Trigonellafoenum-gracium*), neem (*Azadiractaindica*), punarnava (*Bhoeraviadiffusa*), tulsi (Ocimum sanctum), bhuiamla (*Phyllanthus emblica*) and garlic (*Allium sativa*) are commonly used as medicinal herbs in India and have antibacterial, antifungal, anti-inflammatory, antioxidant, growth promoting, hepatoprotective and immuno-stimulatory activities. Non starch polysaccharides (NSP) present in corn and soybeans are poorly digested by monogastric animals; represent a potential source

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 746-748

Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pande
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshiand
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar Maurya
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vitro evaluation of bioagents, botanical and fungicides against *Fusarium oxysporum* f.sp. *baisilici*

Rajendra Prasad, SK Pande, Subhash Chandra, Neeraj Kumar Rajvanshiand and Manish Kumar Maurya

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. *In vitro* studies reveal that highest inhibition was observed in chemical fungicide Tebuconazole (91.81) followed by other fungicide Mancozeb (78.33) followed by bio-agents *Trichoderma viride* (74.82), *Trichoderma harzianum* (71.77) *and Pseudomonas fluorescence* (69.55) *and* one botanical Neem leaves (65.55) in respect to control. All the bio-agents produce toxic volatile metavolatile, which reduced the radial growth of the test fungus. That is *Fusarium oxysporum* f.sp.*baisilici* (7.50) Tebuconazole, Mancozeb (19.57) followed by bio-agents *Trichoderma viride* (22.62) *Trichoderma harzianum* (25.40) *and Pseudomonas fluorescence* (27.40) *and* one botanical Neem leaves (31.00).

Keywords: Tulsi, *Pseudomonas fluorescence,* Tebuconazole.

1. Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L. (Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum sims* (Dulal Tulsi), *Ocimum baisilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke* (Camphor Basil) *and Ocimum americanum* Linn (Hoary Basil) among them holy Basil (*Ocimum sanctum*) has been well known for its therapeutic potential (Prakash and Gupta, 2005) [4]. The chemical constiuents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*. 2004) [2]
In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy, haemeopathy, leucoderma, asthma, bronchitis, catarrhal fever, otalgeia, hepatopathy, vomiting, lumbago, hiccups, ophthalmia, gastropathy, genitourinary disorders, ringworm, verminosis and skin diseases etc. It is commonly used in cough, cold and mild indigestion. Despite its therapeutic potential, holy Basil is susceptible to various disease including *Fusarium* wilt, Bacterial leaf spot, Dampping off, and Downy mildew, among them wilt caused by *Fusarium oxysporum* f. sp. *baisilici,* is most common and destructive disease of holy Basil. It becomes a

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 809-811

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of lentil genotypes against *Fusarium oxysporum* f. sp. *lentis* in field condition

Subhash Chandra, Mukesh Kumar, Neeraj Kumar Rajvanshi and Virendra Prasad Chaudhary

Abstract
Lentil (*Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. Lentil wilt is a very destructive disease caused by fungus *Fusariumoxysporum* f. sp. *Lentis*. In India, lentil crop suffers a great loss due to this disease. The use of resistant variety is one of the best methods of disease management. Therefore, studies were planned to search out the genotypes against *Fusarium* wilt through sick plot technique. Keeping this point in view, one hundred forty three genotypes of lentil were tested for the resistance against *Fusariumoxysporum* f. sp. *lentis* in field condition, out of which 53 genotypes were found highly resistant, 35 genotypes were found resistant, 16 genotypes were found moderately resistant, 18 genotypes were found susceptible and 21 genotypes highly susceptible. None of these genotypes was found free from infection.

Keywords: Lentil, *Fusarium*, genotypes, resistant

Introduction
Lentil *(Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. It has a high nutritional value and major source of dietary proteins (25%) after soybeans (Zia *et al.*, 2011) [8]. Lentil (*Lens culinaris* Medik L.) is the most important pulse crop in India and mostly grown in north east plain zone & central part of India. It is a diploid and self-pollinated crop which is grown in winter season and belonging to Order- Rosales, suborder- Rosneae, Family- Leguminaceae (fabaceae), subfamily- papilionaceae, genus- *Lens* and species- *culinaris* with chromosome number 2n=14. Among *rabi* pulses, lentil is next to chickpea. The total area under lentil in India was 1.49 m ha with a total production of 1.61 MT and 1006 Kg/ha productivity (Anonymous, 2018) [1]. In Uttar Pradesh, it is grown on 4.78 lakh hac. area with 4.47 lakh tones production and productivity 936 kg/ha (Anonymous, 2018) [1].

Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by *Fusarium oxysporum* f. sp. *lentis*. Average yield of lentil is low due to various diseases. Among the disease, foot and root rot of lentil caused by *Fusarium oxysporum* and *Sclerotium rolfisii* are common and the most serious disease in India. The fusarium wilt of lentil caused by *Fusarium oxysporum* f. sp. *lentis* is one of the most important and destructive disease in India wilt pathogen minimize crop yield and deteriorate the seed quality (Khare, 1991) [5]. The disease was first reported from Hungary but in India it was first observed in 1941 from Delhi and Karnal. If infection takes place in early stage the plant do not produced seeds, formed few in number when infection occurred in later stage. Wilt causes more damage at flowering and

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 732-734

Veer Singh
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Susheel Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Veer Singh
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

To evaluate the efficacy of botanicals and chemical against *Cercospora* leaf spot of Sarpagandha (*Rauvolfia serpentina* L.) Benth Ex Kurz. *in vivo*

Veer Singh, Neeraj Kumar Rajvanshi, Subhash Chandra and Susheel Kumar

Abstract
Sarpagandha (*Rauvolfia serpentina*) belongs to family *Apocynaceae* is an evergreen, perennialshrub, erect of the height upto 60cm. It's root are tuberous with pale brown colour, leaves of the plant are in whorls of three lanceolate or obovate, bright green in colour, flowers are in irregular, corymbose infloresence with white and pink colour. Fruits are drupe, single or didymous shining black when fully riped. The minimum percent disease severity was recorded with Neem leaf extract (25.03) followed by botanicals spray, Tulsi leaf extract (27.15), Arjun bark extract (30.46) and Garlic bulb extract (34.66) while, maximum percent disease severity was recorded with Castor bean leaf extract (41.71) as compared to control (76.26). The minimum percent disease severity was recorded with Mancozeb @ 0.25% concentrations (21.77%).The maximum percent control was recorded with Neem leaf extarct (67.16%) followed by Tulsi leaf extract (64.81%), Arjun bark extract (59.94%) and Garlic bulb extract (53.20%) while, minimum percent disease control was recorded with botanical spray of Castor bean leaves extract (45.29%). Highest percent disease control was recorded in fungicide with Mancozeb @ 0.25 % (71.53%). The results showed that each plant extract were more or less inhibit disease growth of *Cercospora rauvolfiae*. The effectiveness of the extracts and the maximum disease management was recorded with Neem leaf extract.

Keywords: Mancozeb, Garlic, Sarpagandha

1. Introduction
Sarpagandha (*Rauvolfia serpentina* Benth.) genus name was given in honour of Dr. Leonhard Rauwolf, a 16th century German botanist, Physician & explorer. *Rauvolfia* is originated from South-East Asia. It is distributed in the Tropical region of Africa and America, Tropical Himalaya, Assam, Pegu, India, Java, Tennasserim, Deccan, Peninsula, Bihar, Sri Lanka, Malay Peninsula, Myanmar, Malaysia and Indonesia. In Nepal, it is found in tropical and subtropical regions from east to west along at 100-900m altitude. The roots of Sarpagandha (*Rauvolfia serpentina* Benth.) have been used in India from century they are prominent, tuberous, with pale brown colour usually branched, 0.5 to 2.5 cm in diameter up to 40 to 60 cm deep into soil. The uprooting of root of crop is recommended at winter (November-December). Roots of 16 exploitable sizes are collected 2-3 years after the plantation, but for commercial cultivation harvesting after 15-18 months is ideal, before digging of roots a light irrigation is suggested. 0.1-4.0 kg fresh roots are obtained from 1.5 years old plants. The average dry root yield of *Rauvolfia* was approximately 2-3 ton under average management

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 746-748

Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pande
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshiand
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar Maurya
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vitro evaluation of bioagents, botanical and fungicides against *Fusarium oxysporum* f.sp. *baisilici*

Rajendra Prasad, SK Pande, Subhash Chandra, Neeraj Kumar Rajvanshiand and Manish Kumar Maurya

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. *In vitro* studies reveal that highest inhibition was observed in chemical fungicide Tebuconazole (91.81) followed by other fungicide Mancozeb (78.33) followed by bio-agents *Trichoderma viride* (74.82), *Trichoderma harzianum* (71.77) *and Pseudomonas fluorescence* (69.55) *and* one botanical Neem leaves (65.55) in respect to control. All the bio-agents produce toxic volatile metavolatile, which reduced the radial growth of the test fungus. That is *Fusarium oxysporum* f.sp.*baisilici* (7.50) Tebuconazole, Mancozeb (19.57) followed by bio-agents *Trichoderma viride* (22.62) *Trichoderma harzianum* (25.40) *and Pseudomonas fluorescence* (27.40) *and* one botanical Neem leaves (31.00).

Keywords: Tulsi, *Pseudomonas fluorescence,* Tebuconazole.

1. Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L. (Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum sims* (Dulal Tulsi), *Ocimum baisilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke* (Camphor Basil) *and Ocimum americanum* Linn (Hoary Basil) among them holy Basil (*Ocimum sanctum*) has been well known for its therapeutic potential (Prakash and Gupta, 2005) [4]. The chemical constiuents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*. 2004) [2]
In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy, haemeopathy, leucoderma, asthma, bronchitis, catarrhal fever, otalgeia, hepatopathy, vomiting, lumbago, hiccups, ophthalmia, gastropathy, genitourinary disorders, ringworm, verminosis and skin diseases etc. It is commonly used in cough, cold and mild indigestion. Despite its therapeutic potential, holy Basil is susceptible to various disease including *Fusarium* wilt, Bacterial leaf spot, Dampping off, and Downy mildew, among them wilt caused by *Fusarium oxysporum* f. sp. *baisilici,* is most common and destructive disease of holy Basil. It becomes a

International Journal of Chemical Studies 2019; SP6: 688-690

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 688-690

Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pandey
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Divya Singh
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vivo evaluation of bio agents, botanical and fungicides against *Fusarium oxysporum* f. sp. *basilica*

Rajendra Prasad, S.K. Pandey, Subhash Chandra, Neeraj Kumar Rajvanshi and Divya Singh

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. For the management of wilt disease of Holy Basil (*Ocimum sanctum*) the experimental finding depicted in Table no.3 reveal that among 6 treatment which include three bio-agent T_1 *Trichoderma viride*, T_2 *Trichoderma harzianum* and T_3 *Pseudomonas fluorescence* and one botanicals T_4 Neem leaves and two chemicals T_5 Tebuconazole and T_6 Mancozeb. The most effective was Tebuconazole 250 EC @ 0.1% with percent disease control and percent disease intensité, (68.20) and (19.67) respectively. And Mancozeb 75WP @ 0.1%. With PDC and PDI (62.54) and (23.17), respectively where as the bio-agent *Trichoderma viride* Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. Distilled water) with PDC and PDI (45.41) and (33.75), respectively. *Trichoderma harzianum* (Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. distilled water) with PDC and PDI (37.02) and (38.94) respectively and *Pseudomonas fluorescence* @ 4 gm/kg seed with PDC and PDI (27.76) and (44.62) respectively. and Neem leaves @ 5% with PDC and PDI (16.98) and (51.53).The used fongicide and bio pesticide significantly reduce the wilt of *Ocimum sanctus*.

Keywords: Tulsi, *Pseudomonas fluorescence,* Tebuconazole

Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L.(Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum Sims* (Dulal Tulsi), *Ocimum basilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke (*Camphor Basil*) and Ocimum americanum* Linn *(*Hoary Basil) among them holy Basil *(Ocimum sanctum)* has been well known for its therapeutic potential (Prakash and Gupta, 2005) [2].The chemical constituents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*.2004) [1] In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy,

doi: 10.5958/0974-0163.2019.00064.8

Evaluation of Pigeon pea genotypes for resistance to *Fusarium* Wilt

Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar, Kumari Punam* and Ramesh Chand**

*Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya – 224 229 (U.P.), *Department of Botany, J. P. University Chhapra (Bihar)*
***Department of Nematology, ND.U.A.&T., Kumarganj, Ayodhya – 224 229(U.P.), India*
<chandrasubhash75@yahoo.in>

Pigeon pea (*Cajanus cajan* L.) is widely adaptable to wide variety of climate and is one of the important legume crops of tropics and subtropics. It played a major role in nutritional security for the people taking cereal based diet. Beside their dietary value and nitrogen fixing ability, pulses also play an important role in sustaining intensive agriculture by improving physical, chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeon pea in India leading to heavy production losses. The *F. udum* is host specific to pigeon pea (Patel *et al*., 2011) and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. For developing resistant varieties, resistant source are the basic requirement. Therefore, the present investigation was undertaken.

Seeds of 58 germplasm of Pigeon pea were obtained from the Department of Genetics and Plant Breeding, N.D.U.A.&T., Ayodhya and ICAR-IIPR, Kanpur. The germplasms were screened under sick plot technique. The plots (sick soil) showed over 90% wilt incidence in susceptible cultivar Bahar of Pigeon pea was used as test variety. After germination, observations were recorded regularly up to 60 days for the appearance of wilt symptoms and severity. The disease was recorded using 1-9 scale for the wilt disease.

Fifty eight germplasms of Pigeon pea were screened for their reaction to *Fusarium udum* in sick plot. It is evident (Table 1) that out of 58, 6 germplasms *viz*.; AKT 201030, IPA 96, IPAF, IPA 204, JSA 59 and WRGE 18 were found resistant, attributing to the higher concentration of phenol as observed by Haldar and Srinivasan (2007), 5 moderately resistant, 10 tolerant, 16 moderately susceptible and 21 germplasm were highly

Table 1. Performance of Pigeon pea genotypes against *Fusarium udum* under field condition (Sick plot technique)

Reaction (Rating scale)	Name of the genotypes
Resistant (1)	AKT201030, IPA96, IPAF, IPA204, JSA59, WRGE18.
Moderately resistant (3)	IPA9F, IPA204, ICP8863, WRGE18, BDN2.
Tolerant (5)	IPA13F, AL1573, H2001-4, HDM04-1, UPAS120, GRG206, JKM197, PT02-9, IPA2F, IPA4F.
Moderately susceptible (7)	IPA12F, WRG123, JKM206, JKM208, PT02-5, PT25-6, AL1514, AL1571, PA325, PT05-37, WPB205, AKT222560, ASI106, JKM209, NDA05-1, WRGE42.
Highly susceptible (9)	IPA11F, IPA14F, IPA15F, IPA34, IPA234, JSA28, PA322, PT01-27, BAHAR, PUSA2006-2, SKN205, WRGE56, CORG990015, PT05-36, IPA1F, IPA3F, IPA5F, IPA5-2, IPA5-3, IPA6F, IPA7F.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 361-362
© 2019 IJCS
Received: 16-05-2019
Accepted: 20-06-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Field evaluation of pigeonpea (*Cajanus cajan*) genotypes against fusarium wilt to disease resistance

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar and Mukesh Kumar

Abstract
The pigeonpea germplasms/genotypes were evaluated to identify the sources of resistance to Fusarium wilt disease. The *F. udum* is host specific to pigeonpea and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. Out of 54 screened genotypes, twenty one genotypes *viz.* BDN2001-6, BRG2-7, CORG2004-01, CORG990013, H2000-37, H2000-47, IPC7119, IPC8863, IPA14F, JKM186, JKM197, JKM204, JKM205, JKM209, KAWR11, KAWR91, NTL30, PT02-25, PT02-5, PT11-39, and PUSA2005-1 were found resistant, 15 moderately resistant, 13 tolerant, 4 moderately susceptible and 1 genotype were highly susceptible against fusarium wilt. The most susceptible variety Bahar showed 80 per cent wilting.

Keywords: Pigeonpea, *Fusarium,* germplasm, resistant

Introduction
Pigeonpea [*Cajanus cajan* (L.) Millsp.], also referred to as red gram or *arhar,* is a perennial shrub, with its centre of origin located in India. It is an important grain legume crop predominantly grown in the Indian subcontinent as an important source of dietary protein. In India, production of Pigeonpea was 42.54 Lac tones on area of 44.31 Lac ha with yield of 960 kg/ha (Anonymous, 2018) [1]. It is also cultivated in other parts of the world, including sub-Saharan Africa, Latin America, the Caribbean and South-East Asia. Its cultivation is increasing in semi-arid areas because of the crop's ability to thrive under prolonged drought and in degraded lands (Upadhyaya *et al*., 2012) [11]. The crop is mainly grown as annual using cultivars with different durations to maturity: 90 days (Short), 120 days (Medium) and 180 days (Long). It is cultivated as a perennial crop in several regions of India. The shift of pigeonpea cultivation from the traditional *kharif* season to pre *rabi* September sowing in north Bihar has not only shown an increased production potential of this important pulse crop but have also opened altogether a new possibilities in land use pattern of the rain fed areas of Bihar and adjoining states. Fresh pods are consumed as a vegetable; dried mature grains are used for cooking or in processing. Among the several factors responsible for reduction yield and quality deterioration of pigeonpea in India, diseases occupy a vital place. Among the diseases, wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeonpea in India leading to heavy production losses. The disease since been reported from Bangladesh, Ghana, Grenanda, Indonesia, Kenya, Malawi, Mauritius, Tanzania, Thialand, Trinida, Uganda and Zambia. In India it is the most serious problem all over the Pigeonpea growing states especially in U.P., M.P., Bihar and Maharashtra. In the epiphytotic conditions, disease incidence was recorded 15-25 per cent in general and up to 50 per cent (Butler, 1910) [2]. In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006) [10].

Materials and Methods
Seeds of fifty four genotypes of Pigeonpea were obtained from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) and IIPR, Kanpur. The genotypes were screened under artificial conditions (Sick plot technique) using the methods described by Nene *et al*., (1982) [5].

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 469-471
© 2019 IJCS
Received: 04-03-2019
Accepted: 08-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against mungbean yellow mosaic virus (MYMV) under field condition

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, Mukesh Kumar and MP Chauhan

Abstract
Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India it is third most important pulse crop after chickpea and pigeonpea. Mungbean is an important short duration grain legume which is grown in different parts of the country, for grain and green manuring. It is an outstanding source of easily digestible proteins with low flatulence, which balances the staple rice diet in Asia. Mungbean yellow mosaic disease (MYMD) caused by whitefly (*Bemisia tabaci*) transmitted mungbean yellow mosaic virus (MYMV) is an important constraint of mungbean in India. Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, out of fifty two genotypes of mungbean were tested for the resistance against MYMV during *Kharif* 2015 in field condition. The per cent disease incidence (PDI) of MYMV among 52 mungbean genotypes was worked out up to ninth week after sowing and it varied from 0 to 79.68 %. Out of fifty two mungbean genotypes, five were found resistance, eight were moderately resistant, seventeen genotypes were recorded moderately susceptible and twenty two genotypes were noticed susceptible. Five genotypes namely, PM 10-18, PUSA 1371, BM 2012-09, DGGV-2 and MH 810 found resistant during present investigation which can be used for the development of mapping population for the development of MYMV resistant varieties.

Keywords: mungbean, genotypes, resistance and yellow mosaic virus

Introduction
Mungbean (*Vigna radiata* L.) is also known as green gram, green bean, moong, mash bean, golden gram and green soy (Saminathan 2013) [10]. In India, the name green gram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [2]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz*., *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [11]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1]. The standard worldwide yield of mungbean is very low (389 kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus, nematodes and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al*., 2005) [3]. Twelve viral diseases are reported on mungbean crop *viz*., Mungbean yellow mosaic virus (MYMV) disease, Bean yellow mosaic virus (BYMV) disease, Southern bean mosaic virus (SBMV) disease, Leaf crinkle virus (LCV) disease, Mungbean mosaic virus (MMV) disease, Cowpea aphid-borne virus (CABV) disease, Cucumber yellow mosaic virus (CMV) disease, Alfalfa

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 466-468
© 2019 IJCS
Received: 01-03-2019
Accepted: 05-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Evaluation of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against web blight

Subhash Chandra, Neeraj Kumar Rajvanshi, MP Chauhan and Mukesh Kumar

Abstract
Web blight (*Rhizoctonia solani*) of mungbean is a very destructive disease caused by fungus *Rhizoctonia solani*. In India, mungbean crop suffers a great loss due to this disease.Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, fifty two genotypes of mungbean were tested for the resistance against web blight in field condition. Out of fifty two genotypes of mungbean were carried out under field condition of natural infection, where twenty nine genotypes *viz*.; BM 2012-09, Palampur 93/kulu-4, LGC 574, NUL 516, T-44, SGC 20, SML 1082 (SC), IPM 312-19, IGKM 06-42, VG 10-008, MH 921, ML 2412, PUSA 571, RMG 1082, PUSA 1472, ML 2410, ML 2333, COGG-912, KM 2348, AKM 12-17, IPM 312-20, GM 11-02, KM 2241, ML 818, HUM-1, CO6, LGG 460, IPM 02-3 and GM 04-02 were found resistant, five genotypes were recorded moderately resistant, thirteen genotypes were noticed moderately susceptible, four genotypes *viz*.; NVL 825, DUG 5, VBN 4, RMG 1028 were recorded susceptible. Only one genotype K-851was found highly susceptible.

Keywords: Evaluation, mungbean, web blight, *Vigna radiate*

Introduction
Mungbean (*Vigna radiata*) belongs to fabaceae family along with good sources of protein, carbohydrates and vitamins for mankind all over the world. Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India, the name greengram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [3]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz*., *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [10]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1].

Mungbean has been considered as "poor men's protein". It contains 26% protein, 51% carbohydrate, 4% minerals, 3% vitamins and 10% moisture (Khan, 1981) [7]. The standard worldwide yield of mungbean is very low (389kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al.*, 2005) [6]. The crop is infected by a large number of pathogens consisting of (virus, bacteria, fungi and nematodes) which significantly contribute to poor yields. Among the diseases, Yellow mosaic, Web blight, Bacterial blight, Leaf crinkle, Powdery mildew, Cercospora leaf spot, Anthracnose and Macrophomina bight are important in different parts of the country which reducing the yield of mungbean heavily. Previously web blight was considered as minor disease.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 439-440
© 2019 IJCS
Received: 24-03-2019
Accepted: 28-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

RM Tripathi
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Reaction of urdbean (*Vigna mungo*) genotypes against *Cercospora* leaf spot (CLS)

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, RM Tripathi and MP Chauhan

Abstract
The present investigation aimed to identify resistance in urdbean (Vigna mungo) against *Cercospora* leaf spot (CLS) in a field condition. The trial was conducted at Genetics and Plant Breeding Farm of Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya. Forty six urdbean genotypes were screened in the summer season of the year of 2015- 2016. The severity of was recorded following 0-9 scale. The urdbean genotypes evaluated were grouped into different categories based on disease reaction. The present results indicated that genotype IPU 11-2, PU 10-23, KU 96-7, Pant U 19, TU 94-2, VBG 09-005, KPU 524-65, NIRB-004, DKU 11, Vamban 7, NDUK 13-6, CO 5, KUG 725, PU 10-16, NUL 7, Pant U 30, WBU 108, NIRB-003, Shekhar 3, NDUK 15-9, TU 67, VBG 12-062, RMG 353, IU 05-1, VBG 11-053, IPM 94-1, RUG 55 and TU 22 were resistant to CLS, 6 genotypes *viz.*; AKU 11-15, K 851, KU 96-3, LBG 645, NIRB-002, COBG 11-03 were exhibited moderately resistant, 05 genotypes *viz.*; LBG 623, MU 46, MU 44, KU 14-1, DBG 11 were showed moderately susceptible, 06 genotypes *viz.*; RUG 59, IPU 2-43, Pant U 31, KUG 479, IPU 13-1, KPU 129-104 were susceptible and only one genotype was highly susceptible. None of these genotypes was found free from infection. The urdbean genotypes which were found resistant the could be the choice for resistance against CLS.

Keywords: urdbean, *Cercospora*, *Vigna mungo*, CLS

Introduction
Pulses represent one of the most important foods that have been extensively used to cover basic protein and energy needs in day today life. Pulses have unique property of maintaining and restoring soil fertility through biological nitrogen fixation as well as covering and improving physical properties of soil by virtue of their deep root system. Urdbean or Blackgram (*Vigna mungo* L.) Hepper is the most important pulse crop of the *'vigna'* group. It is considered to have been domesticated in India from its wild ancestral form (*V. mungo* var. *Silvestris* Lukoki, Marechal & Otoul). Center of genetic diversity is found in India (Zeven and de Wet. 1982) [7]. It is an important crop of India and extensively grown over a wide range of agroclimatic zones of the country.

In India, urdbean occupies 4.50 m ha area, production 2.83 mt and productivity 628 kg/ha (Anonymous, 2018) [1]. Highest productivity of urdbean is reported from West Bengal followed by Andhra Pradesh and Uttar Pradesh. Urdbean is prone to several fungal diseases, among which *Cercospora* leaf spot (CLS) caused by *Cercospora* canescens. Eills and Mortin is one of the most important fungal disease of urdbean causing heavy yield losses particularly in Uttar Pradesh and Uttarakhand states. Disease is also reported from other states *viz.*, Punjab, Haryana, Bihar, Rajasthan, West Bengal, Himachal Pradesh and Jammu & Kashmir (Saksena and Dwivedi, 1973) [6]. Previously *Cercospora* leaf spot was considered as minor disease. Due to change in cropping system and introduction of yellow mosaic resistant varieties it is becoming an important fungal disease and constraint in production of this crop. Resistance is fundamental attributes of all living systems. Host plant resistance (HPR) is the most efficient and ecofriendly means of management. For exploitation of HPR, reliable field and controlled environment screening techniques are essential. Therefore, the present investigation was undertaken with an objective to identify the sources of resistance in different genotypes of urdbean against *Cercospora* leaf spot.

Int.J.Curr.Microbiol.App.Sci (2019) *8*(8): 2733-2743

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 08 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.808.315

Management of White Mold Fungus *Sclerotinia sclerotiorum* (Lib) De Bary Causes Disease in Tomato under *In vitro* Conditions

N. K. Upadhyay[1*], Ved Ratan[1], Subhash Chandra[2], V. K. Yadav[2], Ajay Kumar[2], Deepak Awasthi[1], and Jai P. Rai[3]

[1]*Department of Plant Pathology, C.S. Azad University of Agriculture and Technology, Kanpur-222131(UP), India*
[2]*Department of Plant Pathology, N.D.U.A. & T., Kumarganj, Ayodhya-224229 (UP), India*
[3]*Krishi Vigyan Kendra, Inst. of Ag. Sci., RGSC, BHU, Barkachha, Mirzapur 231001, UP, India*

**Corresponding author*

ABSTRACT

Tomato crop affected by different fungal diseases in which Fruit rot known as target spot disease incited by *Sclerotinia sclerotiorum* is one of the most destructive disease. Disease severity varied (30.50 to 18.60%) in different locations of Kanpur. Highest disease severity was (30.50%) and the lowest disease severity (18.60%) was noticed at the farmer's field of Billhore, Kanpur. *Sclerotinia sclerotiorum* is a soil borne pathogen which causes symptoms on ripe fruits. Pathogen isolated from infected fruits. Copper oxychloride, Kavach, Tebucanazol, Andrachite, Dithane M-45, Metalaxyl, Roko and Bavistin completely suspected the growth of pathogen*in vitro*. Among eight fungicides, Tebuconazol, Andrachite, Metalaxyl, Roko, and Bavistin were found effective against pathogen under *in vitro* and *in vivo* conditions. However, seven bio-agents (*Trichoderma* spp.), *T. koningii*, *T. virens*are found effective in bothconditions. *In vitro* eight fungicides were tested against pathogen in which Metalaxyl, Roko, Tebucanazol, Andrachite and Bavistin showed 100% growth inhibition. Seven bio-agents (*Trichoderma*spp.) were tested *in vitro* while, among them *T. koningii* showed maximum inhibition followed by *T. virens*, *T. longibrachiatum*, *T. atroviridae*, *T. asperallum*, *T. viridae* and *T. reesei*, respectively. Eight treatments were applied *in vivo* for disease management however, among them T_6 (*Bacillus subtilis* + bavistin) recorded the minimum disease incidence and maximum fruit yield.

Keywords

Sclerotinia, management, white mould, *in vitro*, tomato

Article Info

Accepted:
22 July 2019
Available Online:
10 August 2019

Introduction

Sclerotinia sclerotiorum (Lib.) is a serious fungus affecting yield and product quality of many susceptible hosts. It is a widespread soil borne plant pathogen with an extremely wide host range of more than 400 plant species including many of economic importance (Gao *et al.*, 2014). *S. sclerotiorum* is responsible for more than 60 plant diseases (Purdy, 1979). The pathogen produces sclerotia, which survive for long periods and attackroots of growing and mature plants, resulting in root rot, basal stemcanker, and wilt (Duncan *et al.*,

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 809-811

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of lentil genotypes against *Fusarium oxysporum* f. sp. *lentis* in field condition

Subhash Chandra, Mukesh Kumar, Neeraj Kumar Rajvanshi and Virendra Prasad Chaudhary

Abstract
Lentil (*Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. Lentil wilt is a very destructive disease caused by fungus *Fusariumoxysporum* f. sp. *Lentis*. In India, lentil crop suffers a great loss due to this disease. The use of resistant variety is one of the best methods of disease management. Therefore, studies were planned to search out the genotypes against *Fusarium* wilt through sick plot technique. Keeping this point in view, one hundred forty three genotypes of lentil were tested for the resistance against *Fusariumoxysporum* f. sp. *lentis* in field condition, out of which 53 genotypes were found highly resistant, 35 genotypes were found resistant, 16 genotypes were found moderately resistant, 18 genotypes were found susceptible and 21 genotypes highly susceptible. None of these genotypes was found free from infection.

Keywords: Lentil, *Fusarium*, genotypes, resistant

Introduction
Lentil *(Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. It has a high nutritional value and major source of dietary proteins (25%) after soybeans (Zia *et al.*, 2011) [8]. Lentil (*Lens culinaris* Medik L.) is the most important pulse crop in India and mostly grown in north east plain zone & central part of India. It is a diploid and self-pollinated crop which is grown in winter season and belonging to Order- Rosales, suborder- Rosneae, Family- Leguminaceae (fabaceae), subfamily- papilionaceae, genus- *Lens* and species- *culinaris* with chromosome number 2n=14. Among *rabi* pulses, lentil is next to chickpea. The total area under lentil in India was 1.49 m ha with a total production of 1.61 MT and 1006 Kg/ha productivity (Anonymous, 2018) [1]. In Uttar Pradesh, it is grown on 4.78 lakh hac. area with 4.47 lakh tones production and productivity 936 kg/ha (Anonymous, 2018) [1].

Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by *Fusarium oxysporum* f. sp. *lentis*. Average yield of lentil is low due to various diseases. Among the disease, foot and root rot of lentil caused by *Fusarium oxysporum* and *Sclerotium rolfisii* are common and the most serious disease in India. The fusarium wilt of lentil caused by *Fusarium oxysporum* f. sp. *lentis* is one of the most important and destructive disease in India wilt pathogen minimize crop yield and deteriorate the seed quality (Khare, 1991) [5]. The disease was first reported from Hungary but in India it was first observed in 1941 from Delhi and Karnal. If infection takes place in early stage the plant do not produced seeds, formed few in number when infection occurred in later stage. Wilt causes more damage at flowering and

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 732-734

Veer Singh
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Susheel Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Veer Singh
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

To evaluate the efficacy of botanicals and chemical against *Cercospora* leaf spot of Sarpagandha (*Rauvolfia serpentina* L.) Benth Ex Kurz. *in vivo*

Veer Singh, Neeraj Kumar Rajvanshi, Subhash Chandra and Susheel Kumar

Abstract
Sarpagandha (*Rauvolfia serpentina*) belongs to family *Apocynaceae* is an evergreen, perennialshrub, erect of the height upto 60cm. It's root are tuberous with pale brown colour, leaves of the plant are in whorls of three lanceolate or obovate, bright green in colour, flowers are in irregular, corymbose infloresence with white and pink colour. Fruits are drupe, single or didymous shining black when fully riped. The minimum percent disease severity was recorded with Neem leaf extract (25.03) followed by botanicals spray, Tulsi leaf extract (27.15), Arjun bark extract (30.46) and Garlic bulb extract (34.66) while, maximum percent disease severity was recorded with Castor bean leaf extract (41.71) as compared to control (76.26). The minimum percent disease severity was recorded with Mancozeb @ 0.25% concentrations (21.77%).The maximum percent control was recorded with Neem leaf extarct (67.16%) followed by Tulsi leaf extract (64.81%), Arjun bark extract (59.94%) and Garlic bulb extract (53.20%) while, minimum percent disease control was recorded with botanical spray of Castor bean leaves extract (45.29%). Highest percent disease control was recorded in fungicide with Mancozeb @ 0.25 % (71.53%). The results showed that each plant extract were more or less inhibit disease growth of *Cercospora rauvolfiae*. The effectiveness of the extracts and the maximum disease management was recorded with Neem leaf extract.

Keywords: Mancozeb, Garlic, Sarpagandha

1. Introduction
Sarpagandha (*Rauvolfia serpentina* Benth.) genus name was given in honour of Dr. Leonhard Rauwolf, a 16th century German botanist, Physician & explorer. *Rauvolfia* is originated from South-East Asia. It is distributed in the Tropical region of Africa and America, Tropical Himalaya, Assam, Pegu, India, Java, Tennasserim, Deccan, Peninsula, Bihar, Sri Lanka, Malay Peninsula, Myanmar, Malaysia and Indonesia. In Nepal, it is found in tropical and subtropical regions from east to west along at 100-900m altitude. The roots of Sarpagandha (*Rauvolfia serpentina* Benth.) have been used in India from century they are prominent, tuberous, with pale brown colour usually branched, 0.5 to 2.5 cm in diameter up to 40 to 60 cm deep into soil. The uprooting of root of crop is recommended at winter (November-December). Roots of 16 exploitable sizes are collected 2-3 years after the plantation, but for commercial cultivation harvesting after 15-18 months is ideal, before digging of roots a light irrigation is suggested. 0.1-4.0 kg fresh roots are obtained from 1.5 years old plants. The average dry root yield of *Rauvolfia* was approximately 2-3 ton under average management

Vol 10 No 1, p 215-218

PROPAEDEUTICS OF TRAUMATIC PERICARDITIS IN BUFFALOES

Satya Vrat Singh[1], Jitendra Pratap Singh[1], Rakesh Kumar Gupta[2*], Debasish Niyogi[2], Sonu Jaiswal[3], Ramakant[1], Dinesh Kumar Yadav[1] and SK Maurya[4]

College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj- 224 229, Ayodhya, Uttar Pradesh, INDIA

[1]Department of Veterinary Medicine, [2]Department of Veterinary Pathology, [3]Veterinary Clinical Complex, [4]Department of Veterinary Physiology and Biochemistry

*rakeshguptaa96@gmail.com

Received: 08 April, 2021 **Accepted:** 02 May, 2021

ABSTRACT

The present study encompasses propaedeutics of traumatic pericarditis in 18 buffaloes presented as a guide to early diagnosis. The clinical findings recorded were chronic anorexia, prolonged standing with reluctance to sit or move, brisket oedema and abnormal faeces. The blood picture revealed the presence of band cell, leukocytosis and neutrophilia. Elevated AST was also noted in serology. After postmortem examination, traumatic pericarditis was categorized as fibrinous pericarditis, suppurative pericarditis and vegetative endocarditis.

Keywords: Buffaloes, propaedeutics, traumatic pericarditis

Traumatic pericarditis most commonly results from perforation of the reticulum by metal objects such as nails or wire that have been accidentally incorporated into feed and ingested. This may lead to localized peritonitis, sometimes involving neighbouring organs, and in severe cases, it results in generalized peritonitis (Purohit *et al*, 2015; Constable *et al*, 2017; Sodhi *et al*, 2019). Acute disease usually results in distinct signs that include anorexia, decreased milk production, fever, ruminal atony and tympany, abdominal pain, arched back, abdominal guarding and tense abdomen (Dabas *et al*, 2012; Parmar *et al*, 2017). The clinical signs in cattle with chronic disease on the other hand are often less apparent (Constable *et al*, 2017; Braun *et al*, 2018). Pinching of the withers, gradual application of pressure followed by the sudden release of pressure on the area between the xiphoid and the umbilicus using a pole and percussion of the abdominal wall with a rubber hammer over the region of the reticulum are the most useful foreign body tests for TRP (Dirksen *et al*, 1990; Braun *et al*, 2018). However, the picture may vary and it is assumed clinical propaedeutics may aid in early diagnosis that may help to stop the progression of the disease and thus save the valuable animal. Ferroscopy and blood trypsin inhibitor spot test (Suthar *et al*, 2012), Cardiac troponin-I and electrocardiographic findings (Devi *et al*, 2014), radiography (Tiwari *et al*, 2018), ultrasonography (Joseph *et al*, 2018) and glutaraldehyde coagulation test (Bishnoi *et al*, 2012) as an ancillary diagnostic aid for detection of severity of traumatic pericarditis in animals were well documented. The present study describes the clinico-pathological changes observed in 18 buffaloes affected with traumatic pericarditis.

Material and Methods

Animals and study design

The study was conducted on 18 buffaloes presented to Veterinary Clinical Complex of the Institute for a period of 4 years from September, 2016 to September, 2020 with a history of chronic anorexia, prolonged standing with reluctance to sit or move and abnormal faeces. A tentative diagnosis of cardiac insufficiency probably due to pericarditis was made based on the history and physical examination. All the animals underwent clinical examination according to the method of Rosenberger (1979). A tentative diagnosis was made based on clinical findings and blood examination. Traumatic pericarditis was also confirmed through postmortem examination and the animals were categorized as per heart lesions i.e. animals with fibrinous pericarditis, suppurative pericarditis and vegetative endocarditis (Sastry and Rao, 2001). The foreign material damaging the heart and peritoneum were collected during postmortem examination. The pattern of clinical findings recorded earlier were then studied.

Blood sampling

Two blood samples (about 10 ml) were collected from each animal from the jugular vein in a vacutainer

B-3340
[1-5]

Indian J. Anim. Res.,
Print ISSN:0367-6722 / Online ISSN:0976-0555

AGRICULTURAL RESEARCH COMMUNICATION CENTRE
www.arccjournals.com/www.ijaronline.in

Study of Prolactin Receptor Gene (PRLR5) polymorphisms and its association with egg production in Kadaknath hens

Shiv Kumar Yadav*, S. K. Maurya, Alok Kumar Yadav[1], Anand Kumar and Kamalesh Yadav

College of Veterinary Science & Animal Husbandry,
Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad- 224 229 (UP) India
Received: 18-11-2011 Accepted: 04-02-2017 DOI:10.18805/ijar.v0iOF.8001

ABSTRACT

The present study was conducted to investigate the polymorphisms of prolactin receptor (PRLR5) gene and its association with egg production in Kadaknath hens. Egg production is a polygenic inheritance trait. Study was conducted on twenty female birds of Kadaknath kept for laying. Egg production performances were recorded as age at first laying (AFE), Body Weight at First Egg (WFE), Mean Egg Weight (MEW) and Total No. of Eggs at 90 days of laying (TEN). Genomic DNA isolated from 2- 3 of blood collected from wing vein of each bird was amplified for prolactin receptor (PRLR5) gene with specific primer by standardizing and optimising the PCR protocols. PCR was performed in a final volume of 20 µl. The amplified PCR products were resolved on the gels to generate polymorphisms. PRLR5 was digested with *BamHI*. Retriction digested products were run on 2% agarose gel electrophoresis. PRLR5 showed two alleles & two genotypes. The frequency of AA genotype at this locus was 0.75 & BB genotype was 0.25. The AFE (d), WFE (Kg), MEW (g) and TEN of Kadaknath hens in the present study were found to be 188.00±0.71, 1.26±0.03, 42.83±0.21 & 37.75±0.59 respectively. Birds with AA genotype of PRLR5 had a significantly ($P<0.05$) better WFE & AFE than BB genotype. Prolactin receptor (PRLR5) genes produced polymorphism in Kadaknath and were associated with egg production traits.

Key words: Egg production performance, Kadaknath, Prolactin receptor gene, PCR-RFLP.

INTRODUTION

Kadaknath is a native Indian breed of poultry. Meat of kadaknath is dark coloured & delicious, also attributed with medicinal qualities. Characteristics of Kadaknath poultry breed include Black coloured meat, Black blue plumage, Black hued internal organs. Most of the internal organs show intense black colouration due to deposition of melanin pigment in the organs. Locally it is known as Kalamasi and their black flesh is very delicious and popular among tribal people. Sometimes this flesh is being used for the treatment of many diseases by tribal, and is also considered an aphrodisiac (Thakur *et al.*, 2006).

Kadaknath do not lay eggs at particular time & start egg laying 6 months onwards. Eggs are in 2-3 clutches in a year with 25-30 eggs/clutch. Kadaknath tolerates extreme climatic conditions of summer heat and cold winter stress and thrives very well under minimal management inputs like poor housing, no health care or supplementary feeding while exhibiting appreciable degree of resistance to diseases compared to other exotic breeds of fowl (Thakur *et al.*, 2006).

The prolactin receptor (PRLR) is a specific receptor for prolactin, which is an anterior pituitary peptide hormone involved in various physiological activities and is essential for reproductive success. The prolactin receptor (PRLR) has an important role in the PRL signal transduction cascade, which is triggered at the onset of broodiness, and PRL exerts its biological functions by acting through the PRLR. Because the PRLR gene is on the Z chromosome, the hypothesis of sex-linked inheritance of broodiness may relate to PRLR gene via its role in PRL signal transduction. Chicken PRL and PRLR have been cloned and mapped (Ohkubo *et al.*, 2000). In avian species, a single form of PRLR containing a cytoplasmic domain comparable to that of the longest isoform of mammalian PRLR has been identified by cDNA cloning (Yamamoto *et al.*, 2003). The membrane-bound PRLR is closely related to the growth hormone receptor and is a member of the cytokine receptor family. Consistent with its diverse effects, the PRLR is expressed ubiquitously in chickens and turkeys (Leclerc *et al.*, 2007 a, b) and levels of receptor in target tissues are up and down-regulated in response to changes in the concentration of circulating PRL.

MATERIALS AND METHODS

Birds and production data: The birds from the poultry farm of College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad were used for the present study. Twenty female birds of Kadaknath breed nearing their age of laying were taken for the present study. Birds were kept in separate

*Corresponding author's e-mail: dr.shivkumarjnp@gmail.com
[1]AGB Division, ICAR-NDRI., Karnal-132001, Haryana, India.

MedCrave
Step into the World of Research

International Journal of Avian & Wildlife Biology

Prolactin Gene and Laying Performance in Aseel Birds

Abstract

Prolactin gene polymorphism at exon 5 of prolactin receptor gene (PRLR5) was studied in Aseel birds along with its interaction with laying performance. Laying performances were recorded as age at first laying (AFE), Body Weight at First Egg (WFE), Mean Egg Weight (MEW) and Total No. of Eggs at 90 days of laying (TEN). DNA was isolated from 2- 3 ml not clear of Blood from 40 birds collected from wing vein. PRLR5 locus was amplified by PCR and the product was restriction digested with Bam HI and resolved on 2% Agarose gels for genotyping. The AFE (d), WFE (Kg), MEW (g) and TEN of Aseel birds in the present study were found to be 188.40±0.22, 1.57±0.03, 43.61±0.36 & 35.48±0.40 respectively. The prolactin gene locus PRLR5 showed two alleles A & B. The frequencies of A and B alleles at this locus were 0.60 and 0.40 respectively. There was no interaction of various laying performances found with alleles of PRLR5.

Keywords: Egg production performance; Kadaknath; Prolactin; Polymorphism; Birds

Research Article

Volume 3 Issue 3 - 2018

SK Maurya[1]* and BM Yadav[2]
[1]Narendra Deva University of Agriculture & Technology, India
[2]Nawab Wajid Ali Shah Zoological Garden, India

*Corresponding author: SK Maurya, Deparment of Veterinary Physiology & Biochemistry, College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture Technology, Kumarganj, Faizabad- 224 229 (UP) India, Tel: +919415720187; Email: skmaurya@yahoo.com

Received: December 29, 2017 | **Published:** February 15, 2018

Abbreviations: MEW: Mean Egg Weight; WFL: Weight at First Laying; AFH: Age of Hens; MEW: Mean Eggs Weight; TEN: Total Number of Eggs

Introduction

Egg productivity is the most important economic trait in egg-laying poultry. Endocrine and environmental factors such as length of photoperiod and feeding allowance can influence egg production [1]. However, a genetic factor would be a prerequisite. Egg production is a polygenic inheritance trait with low to moderate heritability depending on the period involved, a major opportunity for improvement in this trait lies in the period after 40 weeks of age [2,3]. In traditional breeding, genetic improvement based on estimated breeding values requires extensive data from a variety of sources. Prolactin (PRL) is a polypeptide hormone which plays a key role in egg production. Onset of incubation behavior is induced by an increase in PRL secretion, which results in regression of ovary & loss of egg production [4]. Polymorphism in the promotor region specially those that result in change of promoter binding sites, most likely influence mRNA expression and thus influence incubation behaviour and egg production [5]. The Asil or Aseel is a breed of chicken originating from South Punjab/Sindh area of Pakistan and India. The Aseel breed is known for its stamina, pugnacity, majestic gait, and dogged fighting qualities [6]. This breed is characterized by its hardiness and ability to thrive under adverse climatic conditions, and its meat is considered to have a desirable taste and flavor. The superiority of Aseel on other indigenous breeds is due to its hardiness, resemblance to Cornish and larger body size [7]. Almost all the varieties of Aseel are characterized with heavy body weight and poor egg production potential thus leading to low progeny size due to erratic ovulation, short or erratic clutches and broodiness. Due to different biological activities attributed to PRL and PRLR, they can be used as the major candidate genes in molecular animal breeding programs. There is scarce data in case of breeds like Aseel, thus present study was planned.

Materials and Methods

Birds and production data

The birds from the poultry farm of College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture & Technology, Kumarganj, and Faizabad were used for the present study. Forty female birds of Aseel breed nearing their age of laying were taken for the present study. Birds were kept in separate cages for the ease of sample & data collection and were fed ad libitum. The weights at first egg (WFE) were recorded in kg with a balance on the day when they gave their first egg. Age at first egg (AFE) was calculated from the records. Mean weight of eggs (MEW) was taken as average of daily egg weights over a period of 90 days of laying and recorded in g with the help of a monopan balance. Total no. of eggs (TEN) represented the number of eggs laid over the study period of 90 days.

Blood Collection and DNA isolation

Two to three ml of blood was collected from wing vein of each bird in a vacutainer tube containing EDTA. DNA was isolated from 2-3 ml of blood using High salt method of Montgomery and Sise [8] with slight modifications.

Polymerase chain reaction

Polymerase chain reaction was carried out in a Bio-Rad CFX96 Real Time system. Primer pair for PRLR5 was used as described by Rashidi et al. [9], to amplify a fragment of 250 bp from exon 5 of prolactin receptor gene. The sequence of primers is as follows:

Forward: 5'-TTGTCTGCTTTGATTCATTTCC-3'

Reverse: 5'-TGCATTTCATTCTTCCCTTTTT-3'

PCR was performed in a final volume of 50 µl containing:100 ng of genomic DNA, 0.5µM of each primer, 0.2 mm of each dNTPs, 1.5 mM MgCl2, 1.0 U Taq DNA polymerase and 1× reaction buffer. The cycle conditions for PCR included-Initial denaturation of

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 2688-2692

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 2688-2692
Journal homepage: http://www.ijcmas.com

Original Research Article

Analysis of Mitochondrial DNA Variation in Sahiwal Cattle

S. K. Maurya*

Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad-224229 (UP), India
**Corresponding author*

Keywords

D-loop, Mitochondrial DNA, Polymorphism, Sahiwal, Variation

ABSTRACT

Four restriction enzymes were used to study the mitochondrial DNA restriction fragment length polymorphism (mtDNA RFLP) in Sahiwal cattle. D loop of mitochondrial DNA was amplified using a primer for D loop. Restriction endonuclease cleavage patterns of mitochondrial DNA of Sahiwal cattle were analyzed using restriction enzymes AvaII, Bam HI, EcoRI and HaeIII. Restriction enzymes AvaII and BamHI each showed two haplotypes; four haplotypes were shown by HaeIII, whereas EcoRI showed only one haplotype.

Introduction

Mitochondria are eukaryotic cell organelles involved in various cellular functions, including cell proliferation, apoptosis and, mostly important, energy production (Birch-Machin, 2006) by oxidative phosphorylation (Taanman, 1999). These organelles are responsible for approximately 90% of the energy produced by the mammal cell (Boettcher et al, 1996a, 1996b). Mitochondria have their own genome, which is maternally inherited in mammals and is an important source of cytoplasmic genetic variation (Gibson *et al.*, 1997; Birky, 2001).

Domestic cattle, one of the best-known livestock of human societies, are derived from the aurochs, *Bos primigenius*. Presently, there are large numbers of breeds in both *B. taurus* and *B. indicus* cattle in the world and they must be variants of these subspecies. In addition, some domesticated cattle breeds developed from a hybrid of *B. taurus* and *B. indicus* because the two subspecies can interbreed freely. It has been demonstrated that mitochondrial DNA (mtDNA) haplotypes specific for each subspecies exist in native populations of Asian cattle. Analysis of blood groups and protein polymorphisms supports this theory, because two distinct clades consistently appear in the phylogenetic tree of cattle. On the other hand, many taurine genes have been found in several zebu populations, suggesting that gene flow from taurines occurred in Asian zebu populations as an unusual pattern of introgression.

Before applying sequencing and other higher molecular biological tools in genetic studies, RFLP (restriction fragment length

Environment & Ecology 35 (3A) : 2002—2006, July—September 2017
Website : environmentandecology.com ISSN 0970-0420

Association of Prolaction promoter (PRL5) Gene with Egg Production Performance in Kadaknath Hens

Shiv Kumar Yadav, S. K. Maurya, Alok Kumar Yadav, Anand Kumar, Kamalesh Yadav

Received 24 September 2016; Accepted 26 October 2016; Published online 15 November 2016

Abstract A study carried out to study egg production performance and polymorphism of prolacin gene at promoter region (PRL5). Primer pair PRL5 was used to amplify the 439 bp fragment of the chicken PRL gene containing AGCT sequence for AluI restriction enzyme. PRL5 locus for polymorphism was amplified by PCR and the product was resolved by eletrophoresis and performed in 2% agarose gel; Egg production performances were recorded as age at first laying (AFE), Body Weight at First Egg (WFE), Mean Egg Weight (MEW) and Total No. of Eggs at 90 days of laying (TEN). DNA was isolated from 2-3 of Blood of 20 birds collected from wing vein. The AFE (d), WFE (Kg), MEW (g) and TEN of Kadaknath hens in the present study were found to be 188.00 ±0.71, 1.26 ±0.03, 42.83 ± 0.21 and 37.75 and 37.75 ± 0.59 respectively. Theprolacin gene locus PRL5 showed two alleles C and T and three genotypes : CC, CT and TT. The frequencies of C and T aaeles at this locus were 0.50 and 0.50 respectively. The frequencies of CC, CT and TT genotypes were 0.30, 0.40 and 0.30 respectively. the birds of C allels had a significantly (P<0.05) better MEW and TEn than birds of T allele.

Keywords Egg poduction performance, Kadakath, Prolactin, Polymorphism.

Shiv Kumar Yadav[1], S. K. Maurya[1],
Anand Kumar[1], Kamalesh Yadav[1],
Alok Kumar Yadav[2]

[1]College of Veterinary Science and Animal Husbandry,
Narendra Deva University of Agriculture and Technology,
Kumarganj, Faizabad 224229, UP, India
[2]PhD Scholar, AGB Division, ICAR-NDRI,
Karnal, Haryana, India
e-mail : dr.shivkumarjnp@gmail.com
*Correspondence

Introduction

Egg productivity is the most important economic trait in egg-laying poultry [1]. Endocrine and environmental factors such as length of photoperiod and feeding allowance can influence egg production [2]. However, a genetic factor would be a prerequisite. Egg production is a polygenic inheritance trait with low to moderate heritability depending on the period involved, a major opportunity for improvement in this trait lies in the period after 40 weeks of age [3].

Journal of Entomology and Zoology Studies 2021; 9(1): 1784-1786

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2021; 9(1): 1784-1786
© 2021 JEZS
Received: 28-10-2020
Accepted: 30-12-2020

Vinod Sinha
Department of Veterinary Parasitology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

Amit Singh
Department of Veterinary Parasitology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

VK Pal
Department of Veterinary Parasitology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

SK Maurya
Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

Jaswant Singh
Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

Chandra Shekhar
Department of Veterinary Public health and Epidemiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Amit Singh
Department of Veterinary Parasitology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology , Kumarganj, Ayodhya, Uttar Pradesh, India

In-vivo anthelmintic efficacy of powder formulation of *Embelia ribes* fruits and *Vernonia anthelmintica* seeds on ovine gastrointestinal nematodes

Vinod Sinha, Amit Singh, VK Pal, SK Maurya, Jaswant Singh and Chandra Shekhar

Abstract
Powder formulation of *Embelia ribes* fruits and *Vernonia anthelmintica* seeds was evaluated *in-vivo* for anthelmintic efficacy against gastrointestinal nematodes in sheep. In this study, twelve naturally infected female sheep were selected based on egg per gram (EPG) and then randomly divided into two groups, group I (G I) and group II (G II) having six animals each. G I animals was treated with powder formulations of *Embelia ribes* fruits and *Vernonia anthelmintica* seeds (1:1) at the dose rate of 600 mg/kg.b.wt. orally whereas G II animals were left as untreated infected control. Faecal and blood samples were collected on days 0,3,7 and 10 PT to record reduction in faecal egg count and improvement in haematological and biochemical parameters post treatment. On day 10 PT, 62.07% reduction in faecal egg count was observed. Post treatment, there was improvement in haematological, total protein and albumin level indicating reduction in worm burden. AST, ALT and serum creatinine values post treatment suggested no side effects. Coproculture before and after treatment revealed *Haemonchus contortus* to be a predominant strongyle. The study revealed promising activity of the herbal formulations which can be further exploited to improve the efficacy against gastrointestinal nematodes of sheep.

Keywords: gastrointestinal nematodes, sheep, *Embelia ribes*, *Vernonia anthelmintica*, anthelmintic evaluation

Introduction
The problem of anthelmintic resistance poses a great challenge to the successful control programme for the effective management of gastrointestinal nematodes [1]. This eventually results in huge economic losses to the small and marginal farmers whose livelihood depends upon the rearing of sheep and goat. Emergence of resistance problem has been widely reported from various regions of India [2, 3, 4, 5, 6] which led to the search for alternative means of worm control which is not only effective but economical and eco-friendly. Now a day, efforts being made for the development, formulations and evaluation of anthelmintics of herbal origin as an alternative tool for the effective control of gastrointestinal nematodes.
Keeping the above facts in view, the present study was planned to evaluate the efficacy of powder formulations of *Embelia ribes* fruits and *Vernonia anthelmintica* seeds in sheep naturally infected with gastrointestinal nematodes.

Materials and Methods
Powder preparation- *Embelia ribes* fruits and *Vernonia anthelmintica* seeds after being procured from the local market were put in a hot air oven at 40 °C for 8hrs to remove moisture. They were then pulverized to a fine powder using an electric grinder, sieved and kept in air tight container at 4 °C. Both powders were then mixed in the equal ratio (1:1) to be used for *in-vivo* study.

***In -vivo* experiment**
For *in-vivo* study, twelve (12) adult female sheep, weighing 16-30 kg and naturally infected with gastrointestinal nematodes and having egg per gram of faeces (EPG) more than 500 were selected. They were randomly divided into two groups (Group I and Group II) having six animals each. Group I sheep was treated with *Embelia ribes* + *Vernonia anthelmintica* (1:1)

Original Research

Anthelmintic Efficacy of Aqueous-Alcoholic Extracts Formulations of *Embelia ribes* Fruits and *Vernonia anthelmintica* Seeds against Ovine Gastrointestinal Nematodes

Vinod Sinha[1], Amit Singh[1*], V. K. Pal[1] and S. K. Maurya[2]

Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya 224229, Uttar Pradesh, INDIA

[1]Department of Veterinary Parasitology
[2]Department of Veterinary Biochemistry

***Corresponding author:** asingh.vet@gmail.com

Rec. Date:	Jan 04, 2020 06:48
Accept Date:	Feb 18, 2020 04:03
DOI	10.5455/ijlr.20200104064820

Abstract

Aqueous alcoholic (70% ethanol) extracts mixture of Embelia ribes fruits and Vernonia anthelmintica seeds was evaluated for anthelmintic efficacy in sheep having natural infection of gastrointestinal nematodes. Twelve infected sheep were randomly divided into two groups, Group I and Group II comprising six animals each. Group I sheep were treated with Embelia ribes fruits and Vernonia anthelmintica seeds extract (1:1) at dose rate of 100mg /kg. b.wt. orally whereas G II was kept as untreated infected control. Faecal and blood samples from each sheep were collected on 0,3,7 and 10-day post-treatment to record egg per gram of faeces (EPG) and haematological (Hb, PCV and TEC) and biochemical indices (Total plasma protein, serum albumin, ALP, ALT, AST & serum creatinine). On day 10 PT, decrease in egg per gram, improvement in haematological values and increase in serum protein level suggests promising anthelmintic values of aqueous alcoholic extract mixture of Embelia ribes fruits and Vernonia anthelmintica seeds.

Key words: Aqueous-alcoholic *Embelia ribes*, Gastrointestinal Nematodes, Sheep, *Vernonia anthelmintica*

How to cite: Sinha, V., Singh, A., Pal, V., & Maurya, S. (2020). Anthelmintic Efficacy of Aqueous-Alcoholic Extracts Formulations of Embelia ribes Fruits and Vernonia anthelmintica Seeds against Ovine Gastrointestinal Nematodes. International Journal of Livestock Research, 10(3),60-66. doi: 10.5455/ijlr.20200104064820

Introduction

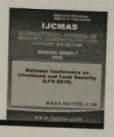
Gastrointestinal nematodes pose a major challenge to the health and productivity of small ruminants causing unaccountable economic losses to small and marginal farmers. Control of gastrointestinal nematodes is largely based on the use of chemotherapeutic drugs but improper and injudicious use of anthelmintics has led to the emergence of resistant strain of the gastrointestinal parasites particularly, *Haemonchus contortus* (Coles,1997). The parasite has been documented to be resistant to all three broad spectrum families of

CC BY NC SA

DOI 10.5455/ijlr.20200104064820

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1367-1370

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1367-1370
Journal homepage: http://www.ijcmas.com



Original Research Article

Polymorphism at Prolactin Promoter Region and its Relation with Production Performance in Aseel Birds

Brijendra Mani Yadav[1,2]*, S.K. Maurya[1], Akanksha Yadav[1] and Shivendra Mani yadav[1]

[1]Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad- 224 229 (UP), India
[2]Nawab Wazid Ali Shah Zoological Garden, Lucknow, India
**Corresponding author*

Keywords

Aseel, Egg production performance, Prolactin, PRL24, Polymorphism

ABSTRACT

Present study was carried out to study egg production performance and polymorphism of Prolactin gene at promoter region (PRL24). Study was conducted on the Aseel hens kept for laying purpose at University poultry farm. Egg production performances were recorded as age at first laying (AFE), Body Weight at First Egg (WFE), Mean Egg Weight (MEW) and Total No. of Eggs at 90 days of laying (TEN). DNA was isolated from 2- 3 of Blood of 40 birds collected from wing vein. PRL24 locus of Prolactin was amplified by PCR and the product was resolved on 6% native PAGE for genotyping. The prolactin gene locus PRL24 showed three genotypes: II, ID & DD. The frequencies of these genotypes were 0.30, 0.45 and 0.25 respectively for II, ID and DD. The II genotype was associated with WFE; ID genotype with TEN and DD genotype was closely associated with MEW.

Introduction

The Asil or Aseel is a breed of chicken originating from South Punjab / Sindh area of Pakistan and India. The Aseel breed is known for its stamina, pugnacity, majestic gait, and dogged fighting qualities (Panda and Mahapatra, 1989). This breed is characterized by its hardiness and ability to thrive under adverse climatic conditions, and its meat is considered to have a desirable taste and flavor. The superiority of Aseel on other indigenous breeds is due to its hardiness, resemblance to Cornish and larger body size (Bhatti *et al.,* 1991). Almost all the varieties of Aseel are characterized with heavy body weight and poor egg production potential thus leading to low progeny size due to erratic ovulation, short or erratic clutches and broodiness. Prolactin (PRL) is a polypeptide hormone which plays a key role in egg production. Onset of incubation behavior is induced by an increase in PRL secretion, which results in regression of ovary & loss of egg production (Sharp, 1997). Polymorphism in the promotor region specially those that result in change of promoter binding sites, most likely influence mRNA expression and thus influence incubation behaviour and egg production (Cui *et al.,* 2006).

Due to different biological activities attributed to PRL, they can be used as the major candidate genes in molecular animal breeding programs. Thus, present study was

STUDIES ON THERAPEUTIC EFFICACY OF PHYTOGENIC MIXTURE IN MANAGEMENT OF SUB CLINICAL MASTITIS IN DAIRY CATTLE

Sarad Kumar[1], S.V. Singh, J.P. Singh, N.K. Singh[2], Ramakant, S. K.Maurya[3] and Ramnayan Yadav[1]
Assistant professor
1. M.V.Sc. Scholars, Department of Veterinary Medicine
2. Assistant Professor, Teaching veterinary Clinical Complex
3. Assistant Professor, Veterinary biochemistry and Physiology
College of Veterinary Science and Animal Husbandry, N.D.U.A. &T., Kumarganj-224229, Faizabad (U.P.)

Abstract

Sub clinical mastitis is a common problem of lactating cows. The higher the production potential, higher is the risk especially if the management is not proper. Antibiotic treatments of sub clinical mastitis is not recommended owing to public health concern. Herbs are safe and free from the menace of resistance. Polyherbal mix possess anti inflammatory, antibacterial, antioxidative, galactogogic and immunostimulatory properties, thereby open new vistas in mastitis therapy. The present study was therefore designed to study the therapeutic potential of polyherbal mix in management of mastitis. A phytogenic mixture was formulated using herbs having antimicrobial, anti inflammatory, immunostimulant and galactagogic properties and administered at two doses i.e. 100gm PO and 150 gm PO and compared with a standard antibiotic therapy. Poly herbal mix @ 150gm/animal daily had comparable therapeutic efficacy with standard antibiotic therapy but had better galactogogic properties. Both the groups had maximum efficacy of 83.33% as compare to 66.67% efficacy in group I. None of the animals in untreated control group showed recovery. Milk yield increased with 9.5% in comparison to an increase by 0.61% in antibiotic treated group.

Introduction

Mastitis is one of the most frequent infectious disease in dairy cattle and is a reason for heavy economic losses and antimicrobial drug uses in dairy cow (Minst *et al.*, 2012). Despite advancements, mastitis continues to rob the dairy industry in terms of decreased milk production, veterinary services, diagnostic, drugs, discarded milk, labour, decreased product quality, increase susceptibility to diseases, increased risk of culling and material for prevention (Hogeveen and osteras 2005). Of the two form of the mastitis, subclinical mastitis is subtle, causes huge economic losses and is difficult to detect as the cow appears healthy, the udder does not show any sign of inflammation and the milk appear normal, but milk production decreases by 10 to 20 % with undesirable effect on its constituents and nutritional value rendering it of low quality and unfit for processing (Holdway, 1992). Alternate medicine aims to boost animals' innate immunity to prevent the establishment of infection in udder. Nutrients supplements have been used with varying encouraging results. Herbs with immune stimulants properties or possessing galacto purifier, anti-inflammatory, antimicrobial properties can be exploited to keep this menace at bay. It will prove wonders if it possesses galactogenic effect too. Herbs been safe are definitely one of the best alternate to this problem as a polyherbal mixed can suffice the needs as desired without any ill effect or public health concerned. The concept of cure under single roof can be made possible if a polyherbal preparation is formulated with such ingredients that their amalgamation not only increases milk production but also cures the subclinical mastitis.

The present study was therefore designed to study the therapeutic efficacy of polyherbal formulation in treatment of subclinical mastitis.

Materials and Methods

The present study was conducted on twenty four cross bred lactating cows showing subclinical mastitis. The cross breds were the crosses of Holstein freisian and were housed, fed and managed under identical manage mental conditions. Screening test namely California mastitis test, white side test and somatic cell count were employed to screen cows for subclinical mastitis. Selected cows were given dietary supplementation with various doses of polyherbal mixture (PHM) containing *Withania Somnifera, Leptadenia reticulate, Bunium bulbocastanum, Tinospora cordifolia and Trigonella Foenum-Graecum*. The cows were randomly divided in to four different groups containing six animals in each group. Each animal of group I were given polyherbal mixture at the dose rate 100 gm (PHM-100) for 15 days. Cows of group II were supplemented with polyherbal mixture at the dose rate of 150 gm (PHM – 150) for 15 days. Cows in group III were supplemented with standard antibiotic treatment that is Ceftizoxime @ 2.5 gm single dose, 6 animals were kept as control and fed normal diet without any supplementation (Group IV).

Statistical analysis was done using t–test as described by Snedecor and Cochran (1994).

Results and Discussion

The efficacy of poly herbal mix was adjudged based on changes in blood and milk profile and comparing the pre and post therapy mastitis screening test indices.

Group I

Animal in group I (PHM, 100) supplemented with poly herbal mix @ 100gm PO for 15 days showed 66.67% recovery. The mean CMT score of 2.15 ± 0.28 on day 0 decreased significantly to 1.06 ± 0.15 after treatment. The mean WST and MST score point decreased insignificantly from 1.93 ± 0.316 and 1.74 ±0.51 to 1.09 ±0.246 and 0.83 ±0.17 respectively. A similar trend was noticed in SCC also as 0 days count decreased significantly from 6.42 ±0.89 ($x10^6$) to 3.24 ± 0.42($x10^6$) after the treatment.

Serum profiles

The levels of total proteins and albumin showed significant increase from 8.92 ±0.86 and 2.96 ±0.36 to 10.06 ±0.66 and 3.68 ± 0.36 respectively after therapy. The level of globulin increased from 5.85±0.154 to 6.26 ± 0.545 after therapy non-significantly. The ratio of albumin and globulin increased non-significantly from 0.50 ±0.118 to 0.58 ±0.116 after the treatment. A nonsignificant increase was observed in calcium level (gm/dl) from 7.09 ±1.71 to 8.69 ±1.40 after treatment. The level of phosphorous (gm/dl) increased from 6.26 ±0.35 to 6.64 ±0.35. (Table 3)

Hematology

The hemoglobin level increased from 8.11±0.27 gm/dl to 8.36 ±0.38 gm/dl. A significant increase in PCV was observed from 25.43 ± 2.06 to 28.63 ±1.54%. A significant decrease in leukocyte count was also recorded. It decreased from 10.82 ±0.65 to 8.36 ±0.80. Post therapy a decline was recorded in neutrophils (%) lymphocytes (%) and eosinophils Count (%) from 43.38±2.42 to 42.12±1.14; 55.63±1.45 to 53.51±1.43 and 1.28±0.26 to 1.04±0.24 respectively (Table 4).

Milk Profile

An increase in milk yield (lts) by 6.87% from 8.73±0.78 to 9.33±1.06 was recorded. A non-significantly increase in fat % from 4.23±0.48 to 4.33± 0.54 was noticed. Similar increase was observed in SNF% and total solid (%) also (Table 5 and 6).

Group II

In group II, 6 animals received supplementation of poly herbal mix @ 150 gm PO OD for 15 days out of which 83.33% (5 animals) recovered completely (Table 1) . A significant declining trend was recorded in the mean CMT score point (2.20±0.11 to 0.85±0.13), WST score point

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2021; 10(1): 2858-2862
Received: 05-11-2020
Accepted: 29-12-2020

Dinesh Kumar Yadav
Ph.D., Scholar, Department of Veterinary Medicine, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Satya Vrat Singh
Ph.D., Scholar, Department of Veterinary Medicine, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Ramakant
Assistant Professor, Department of Veterinary Medicine, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Jitendra Pratap Singh
Assistant Professor, Department of Veterinary Medicine, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Rakesh Kumar Gupta
Ph.D., Scholar, Department of Veterinary Pathology, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

SK Maurya
Assistant Professor, Department of Veterinary Physiology and Biochemistry, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Debasish Niyogi
Professor and Head, Department of Veterinary Pathology, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rakesh Kumar Gupta
Ph.D., Scholar, Department of Veterinary Pathology, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

Ethno-veterinary practices of goat farmers in different districts of Vindhyan Zone of Uttar Pradesh

Dinesh Kumar Yadav, Satya Vrat Singh, Ramakant, Jitendra Pratap Singh, Rakesh Kumar Gupta, SK Maurya and Debasish Niyogi

DOI: https://doi.org/10.22271/phyto.2021.v10.i1an.13794

Abstract
Ethno-Veterinary Medicine (EVM) is the use of medicinal plants, surgical techniques and traditional management practices to prevent and treat spectrum of livestock diseases. Ethnoveterinary practices used by goat farmers in different districts of Vindhyan zone were studied for rhinitis, bronchitis (coughing), pyrexia of unknown origin, enteritis, skin disorders, mouth ulcer and udder abnormality, and information collected from 120 respondents. In case of Rhinitis commonly used ingredients were neem oil, mustard oil, ajwain (*Trachyspermum ammi*), ginger (*Zingiber officinale*), jaggery, garlic (*Allium sativum*) and asafoetida. For treatment of Bronchitis, mostly respondents used neem oil and ajwain. Neem oil, mustard oil, ajwain. Salt, ginger and garlic were used to treat pyrexia. Heeng, Sesam leaves and neem oil were used for treatment of enteritis. Local application of neem oil and neem leaf paste was the most common practice for treatment of skin disorders. For treatment of mouth ulcer, maximum respondents used neem oil and 40% respondents used neem leaf. Alum, salt, neem oil and amla were used to treat udder abnormality in different districts of Vindhyan Zone.

Keywords: Ethnoveterinary practices, goats, Vindhyan Zone, Uttar Pradesh

Introduction
Traditional veterinary medicine is very important in developing countries where conventional remedies for animal health care are inaccessible or unaffordable to poor rural farmers (Nguyen *et al*., 2005; McGaw *et al*., 2007) [19, 16]. About 80% of people in the world today rely on folk (or traditional) medicine for treating both human and animal diseases (Iqbal *et al*., 2003; Muhammad *et al*., 2005) [11, 17]. According to the United Nations Food and Agricultural Organization (FAO), the lack of drugs to treat diseases and infections results in losses of 30–35% in the breeding sector of many developing countries, where poor animal health remains the major constraint to increased production (FAO, 2002) [8]. The use of animals for medicinal purposes is part of a body of traditional knowledge that is increasingly becoming more relevant to discussions on conservation biology, public health policies, sustainable management of natural resources, biological prospection and patents (Alves and Rosa, 2005; Alves *et al*. 2010a, b, c and Souto *et al*., 2009) [3, 6, 5, 4, 22].
Small scale farmers reported that use of commercial drugs is effective in reducing parasites that cause diseases (Iqbal *et al*., 2005; Mathias, 2007; Mwale and Masika, 2009) [12, 15]. However, their use causes harm if not used properly (McGaw *et al*., 2007) [16]. Since they are expensive (Maphosa and Masika, 2010) [14], rural farmers prefer ethno-veterinary medicine' on the other hand, other small scale farmers have been found to combine remedies (Githiori *et al*., 2003; Nalule *et al*., 2011; Tyasi and Nkohla, 2015) [9, 18, 25]. Farmers mostly use medicinal plants, which is a component of EVM, in controlling diseases (McGaw *et al*., 2000). Conventional medicine is a remedy or drug used for diagnosis, treatment of disease and for maintenance of health of an animal (Tyasi *et al*., 2015) [25]. Many diverse conventional products are available to control or treat livestock diseases (Papadopoulos *et al*., 2007) [20];

Materials and Methods
Ethnoveterinary practices used by goat farmers in different districts of Vindhyan zone were studied for rhinitis, bronchitis (coughing), pyrexia of unknown origin, enteritis, skin disorders, mouth ulcer and udder abnormality. Based on the nature of research problem, Ex-post facto research design was followed in the present study. The Vindhyan zone of Uttar Pradesh comprises the districts of Sant Ravidas Nagar, Mirzapur and Sonebhadra. From each selected district, two blocks were selected on the basis of highest goat population. From each block

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 34-37
© 2020 JEZS
Received: 15-01-2020
Accepted: 17-02-2020

VB Singh
Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VK Singh
Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Maurya
Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SP Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SS Sengar
Department of Livestocks Product and Technology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ankit Singh
Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
VK Singh
Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of a phytobiotic, supplemented in different form, on performance, hepatic marker enzymes and carcass characteristics of broiler chickens

VB Singh, VK Singh, S Gautam, SK Maurya, SP Singh, SS Sengar and Ankit Singh

Abstract
A study was conducted to evaluate the impact of a phytobiotic supplemented in different form in the diet on the performance, changes in hepatic marker enzymes and broiler's carcass characteristics. Two hundred fiftyVencobb-400Y strain broiler chicks were divided into five groups with 10 chicks in each five replicates. Each group was fed with different treatment i.e. a basal diet (NC), basal diet with antibiotic (PC), basal diet with herbal mixture powder (HP), basal diet with aqueous extract (AqE) and alcoholic extract of herbal mixture (AlE).The performance, liver function and carcass parameters of birds were ascertained. There was significantly (P<0.05) higher body weight gain (BWG) in AlE group compared to PC and NC group birds. Feed intake of AqE and AlE group birds were significantly (P<0.05) higher than NC, PC and HP group birds. Energy efficiency ratio (EER) and protein efficiency ratio (PER) of AlE groups was similar to PC, however significantly (P<0.05) higher than NC group broiler chickens. The serum ALT and AST level were significantly (P<0.05) lower in the birds that supplemented herbs in any form powder, aqueous or alcoholic. No significant effect of different treatments on broiler's dressed weight, giblet weight and drawn yield were observed. So, AlE supplementation had hepatoprotective impact and it improves performance of broiler chicken.

Keywords: Broiler, extract, performance and phytobiotic

Introduction
Feed additives are in dispensible element of poultry feed formulation and described as non-nutrient substances that accelerate growth, feed efficiency and are supposed to beneficial for health as well as nutrient metabolism of the animals and poultry (Church and Pond, 1988) [5]. In last few decades antibiotics were the most routinely used feed additives to improve growth and performance of broilers. However, due to the sever health concerns like alteration of natural gut microbiota and drug resistance, use of antibiotics in poultry industry have been banned in many countries (Karangiya *et al.*, 2016) [9]. Ban of antibiotics use in broilers feed ensuing to increased spread of bacterial diseases, poorer growth performance and worsened nutrient utilization in poultry flocks. So there are urgent need of alternative of feed antibiotics which can improve poultry performance without generating drug resistance and residual effect in poultry products. In this context various researchers dig out some possible alternatives of antibiotics like phytobiotics, probiotics, organic acids, prebiotics and synbiotics.
Phytobiotics can be defined as plant derived products like herbs, essential oils and oleorasins in feed supplementation improve broilers performance (Yang *et al.*, 2009) [19]. The bioactive compounds presents in plants and herbs showed greater potential as alternative of antibiotics due to their antimicrobial action, hepatoprotective properties and antioxidant activities (Toghyani *et al.*, 2011) [18]. Certain herbal formulations were tried successfully to improve growth performances, carcass yield (Singh *et al.*, 2016) [15] and gut health (Attia *et al.*, 2017) [2] in broilers. Therefore this study was aimed to evaluate the impact of an herbal preparation supplemented in different forms either powder, aqueous or alcoholic extract in broiler chickens the diets on their performance, hepatic marker enzymes and carcass characteristics.

Materials and Methods
The experiment of 42 days was carried out on 250 broiler chickens of Vencobb-400Y strain on livestock farm complex of Acharya Narendra Deva University of Agriculture and Technology,

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

INCIDENCE OF MAJOR REPRODUCTIVE HEALTH PROBLEMS OF DAIRY CATTLE IN SULTANPUR DISTRICT OF UTTAR PRADESH

S. K. Maurya, O. P. Singh, S. V. Singh and Vidya Sagar
College of Veterinary Sc. & A. H.
N. D. University of Ag. & Tech., Kumarganj, Faizabad

Abstract

Present investigation was carried out to assess the reproductive health problems in the cattle of farmers of different land holding capacity in Sultanpur district of UP. Out of the total animal assessed, 37.98% were found to be affected with one or more of the reproductive problems. The incidence was highest (45.06%) in the cattle of landless farmers, whereas, it was least (30.23%) in the cattle of large category. Anestrous, Repeat breeding and endometritis were found to be the major reproductive problems comprising more than two third of the cases. The minor problems included dystocia, abortions, retention of fetal membrane, still birth etc. Based on the findings, it is concluded that the cattle at the level of farmers are suffering from poor management and reproductive/ breeding systems that is needed to be improved.

Key words: Anestrus, dairy, Infertility, Reproductive disorders, Sultanpur

Introduction

India has diverse animal genetic resources and its relatively large livestock population is well adapted to and distributed among diverse ecological conditions and management systems. The major farm animal genetic resources of the country include cattle and buffaloes. Uttar Pradesh has the maximum number of total livestock population in India, with a number of 58.5 million.

In spite of the presence of largest animal genetic resources, the productivity (i.e., meat and milk) of livestock remains low in India, for various reasons, such as inadequate nutrition, poor genetic potential, inadequate animal health services, and other management-related problems.

However, animal performance depends not only on genetic merits, but also on other factors, such as nutrition, management, health, and environment. Thus, to ensure their success, crossbreeding programmes need to be monitored regularly, by evaluating the reproductive problems of the cattle under the prevailing management and environmental conditions. The farmers and livestock owners must be aware about proper management of their livestock. Thus, the present study was undertaken to evaluate the reproductive problems of dairy cattle in the Sultanpur district of UP under semi intensive farming system.

Materials and Methods

The livestock owners were selected from the 30 villages of 10 blocks in 5 tehsils of Sultanpur district. Farmers were selected on the basis of stratified random design for the present investigation. In each village, the livestock owners were categorized as per their land holding capacity, viz. landless, marginal (up to 1 ha), small (1.0 to 2.0 ha) and large (>2.0 ha) farmers. The pooled data comprised a minimum of 50 livestock owners from each socio-economic group. A total of 1514 cattle were included in the study. Cross-sectional study, employing questionnaire survey, and regular follow up using some laboratory evaluation were employed in this study. Each farmer was surveyed on the basis of a pre-tested questionnaire. The various reproductive problems identified were defined and recorded based on their standard descriptions/definitions. Data thus obtained were analyzed using standard statistical procedures.

Results and Discussion

The total number of cattle examined in different farmers group in Sultanpur district during the study and the number of animals found to be reproductively abnormal is represented in Table 1

Table 1 Incidence of cumulative reproductive disorders in cattle in different categories of farmers

	Total Animal Examined	Physiologically Reproductive normal animal		Animals with reproductive abnormalities	
	No.	No.	%	No.	%
Landless	395	217	54.94	178	45.06
Marginal	407	247	60.69	160	39.31
Small	418	270	64.59	148	35.41
Large	294	205	69.73	89	30.23
Total	1514	939	62.02	575	37.98

The incidence of one or more reproductive problem was 45.06%, 39.31%, 35.41% and 30.23% for the animals of landless, marginal, small and large categories respectively. For the pooled population, the incidence was 37.98 %. Incidence of different individual reproductive problems in cattle in different categories of farmers is represented in Table 2

Table 2 Incidence of various reproductive problems of cattle in different categories of farmers

	Landless		Marginal		Small		Large		Pooled	
	No.	%	No.	%	No.	%	No.	%	No.	%
Anoestrus	88	49.44	77	48.13	54	36.49	17	19.10	236	41.04
Repeat Breeding	24	13.48	19	11.88	37	25.00	38	42.70	118	20.52
Endometritis	21	11.80	27	16.88	28	18.92	19	21.35	95	16.52
Dystocia	05	2.81	05	3.13	14	9.46	06	6.74	30	5.22
Abortions	18	10.11	16	10.00	04	2.70	02	2.25	40	6.96
RFM	17	9.55	11	6.88	09	6.08	04	4.49	41	7.13
Prolapse	03	1.69	04	2.5	01	0.68	02	2.25	10	1.74

J. Exp. Zool. India Vol. 25, No. 1, pp. 63-67, 2022	www.connectjournals.com/jez	*ISSN 0972-0030*
DocID: https://connectjournals.com/03895.2022.25.63		eISSN 0976-1780

EPIDEMIOLOGY OF GASTROINTESTINAL PARASITES OF GOAT IN VINDHYAN ZONE OF UTTAR PRADESH

Dinesh Kumar Yadav[1], Satya Vrat Singh[1], Jitendra Pratap Singh[1], Ramakant[1], Rakesh Kumar Gupta*[2], S. K. Maurya[3] and Debasish Niyogi[2]

[1]Department of Veterinary Medicine, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya - 224 229, India.
[2]Department of Veterinary Pathology, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya - 224 229, India.
[2]Department of Veterinary Physiology and Biochemistry, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya - 224 229, India.
*e-mail : rakeshguptaa96@gmail.com

(Received 14 August 2021, Revised 11 October 2021, Accepted 24 October 2021)

ABSTRACT : The present study was conducted to study the epidemiological survey of gastrointestinal parasites in the goat in the Vindhyan zone of Uttar Pradesh. Total 72 faecal examinations was done from goat. The incidence of Strongylus was highest in Sant Ravidas Nagar and Mirzapur districts (each 25%) of this zone in comparison to 16.67% incidence in Sonebhadra district. Similarly, Trichuris (25%) was most commonly recorded in goats of Sant Ravidas Nagar and Mirzapur districts of this zone; its incidence was least in Sonebhadra district (8.33%). Amphistome (8.33%) was reported only from Sant Ravidas Nagar district. Only 31.67% of goat owners regularly dewormed their goats. Amongst GI parasites the incidence of Strongylus was highest. The present study provides basic data about the most prevalent GIT diseases among goats in different district of Vindhyan zone.

Key words : Gastrointestinal parasites, prevalence, goat.

How to cite : Dinesh Kumar Yadav, Satya Vrat Singh, Jitendra Pratap Singh, Ramakant, Rakesh Kumar Gupta, S. K. Maurya and Debasish Niyogi (2022) Epidemiology of gastrointestinal parasites of goat in Vindhyan Zone of Uttar Pradesh. *J. Exp. Zool. India* **25**, 63-67. DocID: https://connectjournals.com/03895.2022.25.63

INTRODUCTION

In India, parasitic infection is one of the most common problems of sheep and goats. In animals, parasitic diseases comprise of helminth, arthropods and protozoa but gastrointestinal nematodes are most common and widely distributed helminth parasite. A related study reported that among the gastrointestinal parasites (GIP), Strongyle nematodes are considered as one of the extremely pathogenic and economically significant parasites affecting small ruminants (Jurasek *et al*, 2010). Infections of gastrointestinal helminths and enteric protozoan parasites among goats are implicated in serious economic losses including morbidity and mortality, mostly for young animals (Majeed *et al*, 2015).

Helminthiasis, especially parasitic gastroenteritis, pose a serious health threat and a limitation to the productivity of small ruminants due to the associated morbidity, mortality, cost of treatment and control measures (Nwosu *et al*, 2007). In addition to these threats, infestation with helminthes lowers the animal's immunity and renders it more susceptible to other pathogenic infections; finally this may result in heavy economic losses (Garedaghi *et al*, 2011).

Gastrointestinal nematodiasis is caused by a variety of nematodes *viz*. *Haemonchus* spp., *Ostertagia* spp., *Trichostrongylus* spp., *Bunostomum* spp., *Strongyloides* spp., *Cooperia* spp., *Nematodirus* spp. results into parasitic gastroenteritis (PGE). Among them, *H. contortus* is a predominant and highly pathogenic gastrointestinal nematode responsible for impaired productivity in small ruminants throughout the world (Khalafalla *et al*, 2011).

Prevalence or occurrence of parasitic gastroenteritis caused by gastrointestinal nematodes is most commonly found in tropical and sub-tropical regions where the environmental factors like temperature, humidity and rainfall are conducive for propagation of pre-parasitic stages. The prevalence of gastrointestinal nematodosis greatly varies from region to region due to diversity in agro-climatic conditions. Several reports have been

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 2683-2687

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 2683-2687
Journal homepage: http://www.ijcmas.com

Original Research Article

Relationship of Seminal Plasma Protein with Semen Characteristics of Murrah Buffalo Bulls

S.K. Maurya*

Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad- 224 229 (UP) India
**Corresponding author email id: skmaurya@yahoo.com*

Keywords

Buffalo, Proteins, Seminal plasma, Sperm characteristics

A B S T R A C T

Present study was carried out to assess the protein profile of Murrah buffalo seminal plasma by using SDS-PAGE and their relationship with the semen characteristics. Semen samples were collected by a bovine artificial vagina from Murrah buffalo bulls maintained at College of Veterinary Science, N. D. University of Agriculture & Technology, Kumarganj, Faizabad. Semen characteristics were measured using standard procedures. Seminal plasma was separated after centrifugation of semen at 5000 rpm for 10 min. The supernatants were collected and precipitated using nine volumes of cold ethanol, and the proteins recovered. These seminal plasma proteins were separated on a 12% SDS-PAGE using standard procedure. A total of 22 protein bands could be identified by the fractionation of seminal plasma protein on the SDS-PAGE; ranging from 14.1 kDa to 88 kDa. Some of these bands were more prominent in some samples. A protein fraction of 25.8 kDa was significantly correlated with progressive motility of sperm in frozen samples. The semen samples that had greater sperm viability showed a prominent fraction of 58 kDa protein in both fresh and frozen samples.

Introduction

Artificial insemination in cattle and buffalo is the common practice; and to keep the success at high, the quality of the semen must be good. Though efforts have been given by using different extenders to improve keeping qualities of frozen semen, still success is not satisfactory. Seminal plasma, which is a complex mixture of secretions from testis, epididymis and accessory glands, contains factors that modulate the fertilizing ability of sperm (Henalut et al, 1995). Bovine seminal plasma contains a family of major proteins, designated BSP-A1/-A2 and BSP-A3, with apparent molecular masses ranging from 15 to 17 kDa, and the BSP-30 kDa protein with molecular mass of 28–30 kDa, collectively called BSP proteins (Manjunath, 1984). The biological properties of BSP proteins have been extensively studied and it have been indicated that seminal plasma proteins reverts the cold-shock damage on ram sperm membrane (Jobim et al, 2004).

A correlation between seminal plasma proteins and fertility of the male has been reported in some species of domestic animals such as bull (Killian et al, 1993),

Journal of Entomology and Zoology Studies 2021; 9(1): 1887-1895

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

Journal of Entomology and Zoology Studies

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2021; 9(1): 1887-1895
© 2021 JEZS
Received: 04-10-2020
Accepted: 06-12-2020

Asha Lata Murmu
M.V.Sc. Scholar, Department of Vety. Physiology, R.V.C., Ranchi, Jharkhand, India

RK Verma
Assistant Professor, Department of Vety. Physiology, R.V.C., Ranchi, Jharkhand, India

Shiv Kumar Yadav
Assistant Professor-cum-Junior Scientist, Department of Vety. Biochemistry, R.V.C., Ranchi, Jharkhand, India

Sasmita Barik
Assistant Professor-cum-Junior Scientist, Department of Vety. Biochemistry, R.V.C., Ranchi, Jharkhand, India

SK Maurya
Assistant Professor, Department of Vety. Biochemistry, CVSc & AH, Kumarganj, Ayodhya, Uttar Pradesh, India

Sanjay Kumar
Scientist (A. H), KVK, Dumka, Jharkhand, India

Corresponding Author:
RK Verma
Assistant Professor, Department of Vety. Physiology, R.V.C., Ranchi, Jharkhand, India

Effects of different meteorological variables on blood biochemical parametersin black Bengal goats

Asha Lata Murmu, RK Verma, Shiv Kumar Yadav, Sasmita Barik, SK Maurya and Sanjay Kumar

DOI: https://doi.org/10.22271/j.ento.2021.v9.i1aa.8407

Abstract
Despite having well-developed mechanisms of thermoregulation, animals do not maintain strict homeothermy under extreme climatic conditions. As a result, animals develop various adaptive mechanisms that enable them to survive under those conditions of extreme heat or extreme cold. The study was conducted on twelve healthy Black Bengal Goats to determine the effect of seasonal variations on biochemical profiles during autumn and winter. Blood samples collected from the jugular vein at fortnightly interval used for biochemical analysis. Among the biochemical constituents the mean concentration of glucose (mg/dl) was found to be significantly ($p<0.05$) higher during winter than the autumn season and observed to be inversely proportional to the THI. The estimated serum total protein non-significantly differed and was directly proportional to the THI. The serum mineral profile studied in Black Bengal Goat showed significant ($p<0.05$) variation in between the seasons. The serum calcium (mg/dl), inorganic phosphorous (mg/dl) and magnesium level were significantly ($p<0.05$) lowered during winter than autumn and were found to be directly proportional to the THI. The study revealed that some of the parameters studied were visibly drifted from normal values as a result of climate stress during the winter season.

Keywords: temperature humidity index, dry bulb temperature, wet bulb temperature, total serum protein

1. Introduction
In the present era, climate change is the most concerned and critical challenge that both human and animals were facing. Food, nutrition and environmental security in the new millennium are challenging job for the agricultural scientists. Alteration in temperature, rain, wind, radiation etc have a definite impact on the productivity of animals and hence implying the concerned food security also. Goats (*Capra hircus*) are the earliest animals to be domesticated for meat and milk purpose and are generally labeled as a "poor man's cow "and as a 'wet nurse' of infants in Europe (Mac Hugh and Bradley, 2001) [21]. Common breeds of goats found in India are Jamunapari, Marwari, Kutchi, Surti, Gohilwadi, Barbari, Gaddi, Chegu, Sirohi, Osmanabadi, Black Bengal, Beetal, Zalawadi, Mehsani. Among these, Black Bengal goats are found throughout West Bengal, Jharkhand, Bihar and Orissa regions of north eastern India. It has the specific feature of strong adaptability to various adverse socio-economic situation of the rural India and arid tropics because of its ability to conserve water, travel well, graze selectively and take willingly a wide variety of vegetation (Meferlane and Howard, 1972; Maloity and Taylor 1971; Merrill *et al.*, 1965) [23, 22, 24]. Goats adapt poorly to cold climates but make them relatively more adapted to areas of high temperatures (Shelton and spiller, 1977) [33]. Adaptation of animals for ecological stresscan affect serum biochemistry of livestock animals (Swanson *et al.*, 2004; Nazifi *et al.*, 2003) [36, 27]. Serum biochemical analysis constitute important panels in the diagnosis, prognosis and treatment of livestock diseases (Yokus *et al.*, 2006) [39]. The seasonal rythms reflect the endogenous adaptive mechanism to react in advance to the regular environmental changes associated with the seasons (Piccione *et al.*, 2009) [29]. Limited information is provided about the seasonal rythms of small ruminants like Goats in tropical climate (Piccione *et al.*, 2009; Alila-Johansson *et al.*, 2001, 2004) [29, 3]. Minerals also play an important role in increasing efficiency of livestock production and reproduction as they act as catalysts in the enzymes and hormonal systems of the body (Ceylan

International Refereed, Peer Reviewed & Indexed Quarterly Online Journal, Abstracted & Cross-indexed

EFFECT OF A-TOCOPHEROL ACETATE AND ZINC SUPPLEMENTATION ON LEPTIN HORMONE DURING DRY PERIOD AND EARLY LACTATION IN CROSS BRED COWS

Pankaj Kumar Maurya*, Anjali Aggarwal[1], Pramod Kumar and P.K. Choudhary
College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP)
[1]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001 (Haryana)

Abstract

The study was conducted to investigate the effect of α-tocopherol acetate and zinc supplementation on Leptin Hormone during dry period and early lactation in cross bred cows. Twenty pregnant Karan Fries cows were selected on the basis of their body weight, BCS and parity. Ten cows were kept in control group and other ten cows in treatment group which were supplemented with 1000 IU α-tocopherol acetate and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Leptin hormone. Body condition score of all the experimental animals was recorded on the day of blood collection. At parturition, BCS decreased significantly (P<0.01) in control group than treatment group. The plasma concentration of leptin was decreased at parturition and the level was significantly (P<0.001) higher in treatment group as compared to control group (3.66 vs. 2.55 ng/ml). Plasma NEFA was significantly (P<0.001) lower in treatment group as compared to control group. The results of this study indicated that supplementation of α-tocopherol acetate and zinc have beneficial effects in changing Leptin hormone level in such way that improves body condition and metabolic status of the animals.

Keywords: *Leptin, Body Condition Score, Energy Metabolites, α-tocopherol acetate, Zinc*

Introduction

Leptin is a 16 kDa protein hormone and it is synthesized by white adipose tissue. Leptin is involved in regulation of feed intake, energy balance, immunity and reproduction (Houseknecht *et al.*, 2000; Ahima and Flier, 2003). After parturition, dairy cows suffer from an inborne energy deficit caused by the onset of copious milk secretion and an inadequate increase in voluntary food intake which contributes to a decline in plasma leptin. This decline mirrors that of plasma insulin but is reciprocal to the profile of plasma growth hormone (GH), suggesting that both hormones may regulate plasma leptin in periparturient dairy cows (Block *et al.* 2001). Energy deficit of early lactation reduces leptin synthesis in white adipose tissue (WAT), and suggest roles for insulin, GH and metabolic fuels in mediating this effect of energy balance (Block *et al.* 2001). A concomitant suppression of immune functions and metabolic disorders during early lactation are related to decreased fertility (Butler and Smith, 1989). This may partly be due to decrease in blood concentrations of vitamins A & E and Zn (Meglia *et al.* 2001; Chandra, 2009). To meet the nutritional demands of milk synthesis during early lactation, dairy cows need to mobilize body reserves causing negative energy balance until nutrient intake covers the demands.

Material and methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). For the present study 20 Karan Fries (KF) periparturn cows were selected from the herd of National Dairy Research Institute, Karnal. 10 cows kept in Control group and other 10 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of α-tocopherol acetate and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum over and above the normal feeding schedule at dairy farm of NDRI.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD Vacutainer®M, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the date of calving. Blood samples were brought to the laboratory in the ice box soon after collection and centrifuged at 3000 rpm at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Leptin hormone. Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Sample analysis

Blood sample was analyzed for plasma leptin and NEFA. Plasma Leptin was determined by "Bovine Leptin ELISA Quantitation kit" from Cusabio Biotech Co., Ltd. The copper soap solvent extraction method modified by Shipe et al. (1980) was adopted for the estimation of plasma NEFA.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software. The correlations among the various parameters were also calculated (Snedecor and Cochran, 1994).

Results and Discussion

Leptin

The mean±SE of plasma leptin concentration of control cows was 6.06±0.10 ng/ml 60 days before calving and on the day of calving it decreased to 2.55±0.31ng/ml. Further, in treatment group the plasma leptin concentration was 6.19±0.11ng/ml 60 days before calving and on the day of calving it decreased to 3.66±0.11ng/ml. In present study decrease in the plasma leptin concentration of control and treatment group cows was 57.92% and 40.87% respectively from 60 days before calving to the day of calving. This decrease was more significant (P<0.01) from 30 days before calving to the day of calving in control group than treatment group. After parturition it's level remained low up to 30 days then started increasing up to 60 days of lactation.

In present study there was found a positive correlation between leptin with BCS and insulin and a negative correlation was found between leptin with NEFA in control and treatment group of cows around parturition. The plasma concentration of leptin was positively correlated with plasma concentrations of insulin and negatively correlated with plasma concentrations of growth hormone, cortisol and non-esterified fatty acids (Block *et al.*, 2001; Chelikani *et al.*, 2008). Sauerwein *et al.* (2004) investigated that in ruminants the decline in plasma leptin levels towards parturition is probably caused by the decline in adiposity and insulin concentrations. In ruminants and other animals, leptin is synthesized in proportion to the overall degree of adiposity and acts on the central nervous system to reduce voluntary feed intake (Ehrhardt *et al.*, 2000). Leptin, mainly produced in adipose tissue, inhibits food intake and down-regulates adipose tissue deposition. Block *et al.* (2001) showed that leptin is negatively correlated with the amount of nonesterified fatty acids, which reflects the amount of fat mobilization. From early to mid pregnancy circulating leptin levels increased and remained elevated until late pregnancy in cattle (Liefers *et al.*, 2003; Villalobos *et al.*, 2007).

Int.J.Curr.Microbiol.App.Sci (2021) *10*(03): 1330-1338

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 10 Number 03 (2021)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2021.1003.163

Studies on Haemato-biochemical Profile of Goats in Vindhyan Region of Uttar Pradesh, India

Dinesh Kumar Yadav[1], Satya Vrat Singh[1], Jitendra Pratap Singh[1], Ramakant[1], Rakesh Kumar Gupta[2*], Debasish Niyogi[2] and SK. Maurya[3]

[1]Department of Veterinary Medicine, [2]Department of Veterinary Pathology, [3]Department of Veterinary Physiology and Biochemistry, C.V.Sc & A.H, ANDUAT, Ayodhya, Uttar Pradesh, India

**Corresponding author*

Keywords

Haematology, Biochemistry, Vindhyan zone, Goats

Article Info

Accepted:
12 February 2021
Available Online:
10 March 2021

A B S T R A C T

Haematological and biochemical variables of blood are generally used to monitor and evaluate health, nutritional and physiological status of ruminants. The present research was conducted to study haemato-biochemical profile of goats in Vindhyan region of Uttar Pradesh, India. Total 120 blood samples were collected from 120 goats. All haematological parameters taken were within the normal range except haemoglobin, which was lower side of the normal range of the males and was the less than the normal range in females. The range of haemoglobin observed was 8.01 to 8.3 in male and 6.35 to 6.85 in female animals. In females, the packed cell volume was least and significantly lower in Mirzapur district (25.66). The range of total leucocyte count varied from 18.03 to 18.07 in male and 18.00 to 18.07 in females. The value of liver function test was within normal range. There were no significant changes in Liver function test enzymes (AST, ALT and Alkaline phosphatase) and bilirubin profile of goats in different districts of Vindhyan Zone.The value of kidney function test was within normal range. Only blood urea level is slightly higher in Sant Ravidas Nagar.

Introduction

Haematological tests are important tools for evaluation of physiological and health status of farm animals and almost indispensable in organic farming, where permitted veterinary interventions are strictly regulated and limited in scope. Haematological analyses in farm animals have been extensively discussed as an essential part of clinical examination often pointing to a specific differential diagnosis or suggesting a prognosis (Braun *et al.*, 2010; Polizopoulou, 2010; Antunovic *et al.*, 2019).

Biochemical and haematological variables of blood are generally used to monitor and evaluate health, nutritional and physiological status of ruminants (Al-Eissa *et al.*, 2012). The evaluation of blood constituents has been widely used as a marker to determine the efficacy of feed nutrient content and supplements (Belewu and Ogunsola, 2010)

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 292-298

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 **Special Issue-7 pp. 292-298**
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation and Comparison of Heat Stress Indices for Cattle and Buffaloes

Pramod Kumar[1*], R. C. Upadyay[2], Rabindra Kumar[3], P. K. Chaudhary[1], P. K. Maurya[1], Rajesh kumar[3], Vibha Yadav[4] and Mukesh Kumar[5]

[1]Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[2]Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana-130001, India
[3]Department of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[4]Department of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[5]Department of Veterinary Anatomy C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
**Corresponding author*

Keywords

Heat stress, Environmental variables, Heat stress indices, TGWB Index, THI

ABSTRACT

Cattle and buffaloes experience different level of stress during summer and hot humid conditions. However, the assessment of the heat stress and the translation of the heat stress in terms of physiological and psychological strain is complex. For over a century attempts have been made to construct an index, which will describe heat stress satisfactorily. The many indices that have been suggested can be categorized into two groups: "*physiological indices*" and "*environmental*", or "*direct indices*". The first groups are sophisticated indices, which are based on physiological variables; they are difficult to calculate and are not feasible for daily use. The latter group comprises of simple indices, which are based on the measurement of basic environmental variables. In this group many indices are in use for over four decades: the "temperature humidity index" (THI) and the "*TGWB Index*". The following research on heat stress indices and their comparison and evaluation to animal production and their performance. With the present knowledge it is suggested to adopt the TGWB Index under tropical conditions is recommended because globe temperature takes into accounts Tdb and solar radiant heat exchange and can help in finding stress level.

Introduction

In India during summer cattle and buffaloes are exposed to severe environmental heat stress, which may deteriorate productivity and performance of animals may even threaten to their survival. Thus, it is expected that the physiological heat strain experienced by an animal will be related to the total heat stress to which they are exposed, serving the need to maintain body-ore temperature within a relatively narrow range of temperatures. Many attempts have been made to estimate the stress inflicted by a wide range of climate, or to estimate the corresponding physiological strain and to combine them into a single index—a heat stress index. The difficulties in creating a universal heat stress index are outlined in the present research and a simple way to

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON LYMPHOCYTE PERCENT COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], Pramod Kumar[1], D. Niyogi[3] and M. Kumar[4]

[1]Department of Veterinary Physiology and Biochemistry, [2]Department of Veterinary Pathology, [3]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumargunj, Ayodhya, U.P., [4]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. Lymphocyte % in third and fourth month of experiment was significantly ($P<0.05$) lower in all groups (group-I to VII) in comparison to 0 day, first and second month. At fifth month, lymphocyte % was significantly ($P<0.05$) higher in group III, IV, VI and VII in comparision to third and fourth month of experiments.

Keywords: Ewe, Photoperiod, Melatonin, Lymphocyte percent count

Introduction

Short days enhance immune function in individuals with robust reproductive responses to photoperiod. Total splenic lymphocyte number, and macrophage counts were significantly higher in hamsters exposed to short days, as compared to animals exposed to long photoperiods (Brainard *et al.*, 1988). Photoperiodic influences on lymphocyte number and total white blood cell count have been reported for deer mice (Blom *et al.*, 1994); short day (LD 8:16) mice possessed more white blood cells than animals maintained in long day lengths (LD 16:8). Importantly, all laboratory studies of photoperiodic effects on immune function have reported enhanced immune function in short day lengths (Nelson and Demas, 1996). Although many field studies support this hypothesis, with data suggesting enhanced immune function and decreased disease prevalence during the winter as compared to the summer, a substantial number of studies have reported the opposite pattern of results (Nelson and Demas, 1996); i.e., enhanced immune function is coincident with the short days of winter. These conflicting results can be resolved by considering additional environmental factors, not usually manipulated in laboratory studies. For example, winter-associated stressors [e.g., restricted food and low ambient temperatures] appear to counteract short day enhancement of immune function in the lab.

Exogenous administration of melatonin increased the lymphocyte percentage in Broiler chicks (Abozahra *et al.*, 1998), Rats (Anwar *et al.*, 1998), and Squirrels (Rai *et al.*, 2009). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17.30 to 18.00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in lymphocyte percentage is not clear. However, several mechanisms may be involved in this respect. Haldar *et al.* (2006) accessed the effect of melatonin on immune parameters in a seasonally breeding animal, the Indian palm squirrel F. pennanti and bird P. asiatica during reproductive phases in vivo as well as in vitro. Melatonin treated squirrels and birds showed an increase in percent lymphocyte count (% LC) and percent stimulation pinealectomy in squirrels. Melatonin administration recovered all the decreased immune parameters to the control level (Rai and Haldar, 2003). MEL supplementation also enhanced all immune parameters in both in vivo and in vitro, suggesting that the immune system was sensitive during the reproductively active phase to MEL when peripheral melatonin level was low and the role of melatonin could be important for the maintenance of the immune status of seasonal breeders.

As reported by Etim *et al.* (2014[a]) immune status is a function of leucocytes, lymphocytes and Neuteophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine Lymphocyte percent count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36°N latitude and 85.33°E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]:- The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]:- In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]:- Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period

INTEGRATION BETWEEN THE THERMAL STRESS INDEX (TGWB) AND THE LIVESTOCK STRAIN INDEX (LSI) AS A GUIDELINE FOR DAIRY FARMING IN TROPICAL CLIMATE

Pramod Kumar[1]*, R.C.Upadhyay[2], P.K.Chaudhary[1], P. K. Maurya[1], Rishikant[3], Rabindra Kumar[4], Rajesh Kumar[4] and R. P. Diwaker[5] and Vibha Yadav[5]

[1]* Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[2]Rt.HOD & Principal Scientist, Animal Physiology Division, ICAR-NDRI, Karnal-132001 (Hariyana)
[3] Department of Vety. Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP

Abstract

A new thermal stress index (TGWB Index), based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature suggests as a potential substitute for the temperature humidity index (THI) for cattle in tropical climate. This new stress index, found to have a high correlation to THI, is constructed from fast reading meteorological response sensors (Tdb, Twb, and Tg) that take only a few seconds to reach equilibrium. Furthermore, the TGWB Index is the first stress index using direct measurements of solar radiation and is calculated as follows:
TGWB Index = 0.78 (Tg + Twb) + 35.8
The recently suggested Livestock Strain Index (LSI) is capable of indicating physiological strain and analyzing milk production of cattle. The LSI is constructed from rectal temperature (Tre) and respiratory frequency rate (Rf) as follows:
$LSI = 5\ (Tre_{obs.} - Tre_{min.})\ (Tre_{max.} - Tre_{min})^{-1} + 5\ (Rf_{obs.} - Rf_{min.})\ (Rf_{max.} - Rf_{min})^{-1}$
Where Tre_{obs} and Rf_{obs} are the observed measurements Tre_{min} and Tre_{max} and Rf_{min} and Rf_{max} are maximum and minimum simultaneous measurements taken at any time. The LSI is scaled from 0-10, whereby each variable LSI_{Tre} or LSI_{Rf} which represent the cardiovascular and the thermoregulation systems respectively. The purpose of this study was to develop guidelines based on TGWB Index and LSI for dairy cattle for combat to heat stress. In order to integrate LSI and TGWB Index, we decided to use both the LSI_{Rf} and LSI_{Tre} component, which represents the respiratory frequency rate and the strain reflected by the cardiovascular system. Furthermore, LSI_{Rf} and LSI_{Tre} are easier to measure, are easier to implement and simplifies the integration with TGWB Index. Concomitantly, it also categorizes the strain between 0-5, the higher the value, the higher the strain.
Key words: Tropical climate, Thermal stress, Indices, Solar Radiation, LSI, TGWB Index

Introduction

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996; West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$
(Thom, 1959),

$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$
(National Research Council, 1971),

$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$
(National Research Council, 1971),

$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$
(National Research Council, 1971),

$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$
(Yousef, 1985a),

The above indices have been used to calculate stress for each combination of environmental variables corresponding to the measurements made in the animals, in order to assure that each animal response was associated to a given environmental condition. The index THI1 is used to monitor discomfort of temperature and humidity in humans. The THI2 and THI7 have been empirically determined for cattle exposed to heat stress conditions in climatic chambers. How these indices from controlled environments relate to field conditions? With diurnal fluctuation of environmental variables remain unanswered (Bofumanova *et al.*, 2007). The index THI3 is used to monitor the degree of discomfort in humans. The THI5 represents cattle heat stress index, designed to indicate level of heat stress of outdoors cattle (West, 2003); and THI6 has been developed by the United State Weather Bureau to describe discomfort in humans.

THI values of 70 or less are considered comfortable, 75 to 78 stressful, and values greater than 78 because extreme distress and animals are unable to maintain normal body temperature (Silanikove, 2000). The THI fails to reflect the contributions of other environmental factors, such as airflow and thermal radiation.

As noted before, the index has gained immense popularity over the years. The temperature humidity index (THI) is in use in temperate climatic condition for cattle. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy industries (Stokka *et al.*, 1996; West, 1999; Mader *et al.*, 2002). It is important to note the correlation of temperature humidity index (THI) to physiological responses was only partially tested and was based mainly on the correlation between the number of heat stress cases of dairy animal and the heat load as calculated by the THI. I have inroduced my new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature as follows:

TGWB Index = 0.78 (Tg + Twb) + 35.8

This newly developed index was validated by using large databases and was found to be highly correlated to the temperature humidity index (THI). TGWB Index differs from other indices that have been suggested in the past for two main reasons. First, new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature, aside from using temperature

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 1220-1221
© 2019 JEZS
Received: 19-09-2019
Accepted: 21-10-2019

Sandeep Yadav
M.V.Sc. Scholar, Department of Veterinary Medicine, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Vibha Yadav
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology& Biochemistry, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Management of traumatic proptosis in a pug: A case study

Sandeep Yadav, Vibha Yadav, RP Diwakar and Pramod Kumar

Abstract
A three years old male pug dog, weigh 10 kg was presented to Jai Pet Care Clinic Raebareli, Uttar Pradesh for treatment with unilateral traumatic proptosis. All clinical parameters were normal. Physical examination revealed partial prolapse of right eye globe with severe periorbital edema, haemorrhage, absence of menace and presence of miosis. Therapeutic management done by administration of trifluopromazine @4mg/kg I/M for sedation, dexamethasone and gentamicine 0.2ml each in combination injected through intra palpebral route, which was repeated on 5th day. Animal was also given intramuscular injection of gentamicin @5mg/kg, dexamethasone @0.125mg/kg, vitamine B complex 2.0 ml and chlorpheniramine maleate @0.5mg/kg only once for 5 consecutive days. Eye drop of moxifloxacine and dexamethasone 4 times a day for instillation, chloramphenicol ointment 4 times a day for local application and enrofloxacin @5mg/kg orally once for 7 days were used. Animal recovered successfully after 7 days of regular treatment. Vision was assessed by simple vision testing using junction box, after 15 days of recovery and found normal.

Keywords: Pug, proptosis, therapeutic management

Introduction
Proptosis is forward displacement of globe which occur secondary to any blunt trauma to head [7]. Proptosis typically occurs in dogs following trauma to the face or head. Certain breeds of dog are more prone to eye proptosis than others because of their differences in facial conformation. The most common cause of proptosis in small breed dogs is a fight with a larger dog. During trauma, the globe is luxated from the orbit, and eyelid spasms prevent its retraction. Secondary orbital hemorrhage and swelling displace the globe further from the orbit following corneo-conjunctival drying and malacia [7]. Prognosis depends on pupil size and reflexes, duration of exposure, other globe or orbital damage, breed and other systemic trauma. Approximately 40–60% of dogs, but very few cats, recover vision. Traumatic proptosis can occur in any breed and in both dogs and cats. Only 20-40% of dogs that have the reattachment of the eyeball regain their vision.

Case history and observations
A three year old male pug of 10 kg weight was presented at Jai Pet Care Clinic Raebareli, Utter Pradesh with unilateral traumatic proptosis having recent history of blunt head trauma by hitting head against the wall. Clinical examination revealed partial prolapse of right eye globe (fig.-1) through the pulpebral fissure with severe periorbital edema (fig.-2), haemorrhage without fracture of skull. There was absence of menace and presence of miosis. Corneal examination revealed concurrent finding of pigmentary vascular keratitis. All clinical parameters of the pug were normal.

Fig 1: Unilateral partial proptosed globe in a pug

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-IV) : 2668-2670 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

STATISTICAL MODEL APPROACHES TO ASSESS THE EXTENT OF HEAT STRESS IN CATTLE

Pramod Kumar[1], R.C. Upadyay[2], Rabindra Kumar[3], Rajesh Kumar[3] and Vibha Yadav[4]

[1]Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[2]Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana, 130001
[3]Department of Veterinary Obs. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[4]Department of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
E-mail : pihu012013@gmail.com Mobile no. 9452725105

ABSTRACT

In the Changing global scenario, exploding world population, limited natural recourses and environmental degradation are posing a greatest challenge to the sustainable production and reproduction of livestock for human population. Climate change has profound effect on livestock. The anticipated rise in temperature due to climate change is likely to aggravate the heat stress in livestock, adversely affecting their productive and reproductive performance. Heat is the major constraint in tropical and sub tropical climatic conditions which negatively affects production and reproduction of livestock species. Cattle and buffaloes experience different level of stress during summer and hot humid conditions. Climatic conditions in the India are such that the warm (or hot) season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depresses the performance. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines. Temperature-Humidity Index (THI) available with different temperature and humidity weightage are suitable for different specific areas.

Key words : *Global Scenario, Climate change, Livestock, challenges, Heat stress index, THI.*

One of the greatest challenges to production from lactating dairy cattle and buffaloes facing dairy farmers in the India is heat stress. Climatic conditions in the India are such that the warm (or hot) season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003). Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Rectal Temperature : A change in rectal temperature has been considered an index of heat stored in large animals and other mammals. For well-hydrated beef cattle living in temperate climates, the range of normal rectal temperature is 36.7 to 39.1°C (Cunningham, 2002).

Normal rectal temperature in Indian cattle has been reported to be 38.3 ± 0.3°C by Mullick (1961) and Bhattacharya et al., (1965). For zebu cattle and crossbred bullocks, normal rectal temperature was reported to be 38.3 and 38.4°C, respectively (Upadhyay, 1982). Heat inputs cannot be equal to heat outputs at all times; therefore, the maintenance of body temperature within this range is achieved through a system of temperature regulation. To regulate body temperature the animal have a variety of temperature sensors located within the body. There are specific temperatures sensitive neuronal structures located in the skin and in the mucous surfaces of the buccal cavity, in regions of the spinal cord, and in the hypothalamus of the midbrain (Bligh, 1985). These sensors relay information to the pre-optic area of the hypothalamus, which is thought to be the main centre for temperature regulation. The pre-optic area of the hypothalamus then initiates mechanisms to either increase or decrease heat loss or production (Cunningham, 2002). In the regulation of body temperature, the hypothalamus behaves as if it has a normal "set-point". When rectal temperature rises above or falls below the set point, heat losing, or heat gaining mechanisms are initiated (Cunningham. 2002).

Respiration Rate : The other method of evaporative heat loss available in cattle is via respiration. Respiration rate (RR) has long served as a gross indicator of heat during hot weather, increasing when animals need to maintain homoeothermy by dissipating excess heat stress as other avenues become inadequate (Hahn. 1999). The normal

HEAT STRESS INDICES, STANDARDS AND LIMITS WITH REFERENCE FOR CATTLE AND BUFFALOES

Pramod Kumar[1]*, Rishikant[2], Rabindra Kumar[3], Rajesh Kumar[3] Rajpal Diwakar[4] and Vibha Yadav[5]
[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[2] Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[3]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[4&5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels would be a world first and, accordingly, no previous experience in the determination of acceptable heat stress limits, criteria or indices is wholly applicable. However, some tropical countries are already at beyond high temperature and much of the knowledge gained in managing and rearing of animal at such heat stress will be helpful in making adequate planning for acceptable environmental control at the greater thermal stress being contemplated. Accordingly, it is necessary to take cognisance of the dairy industry's experience in most tropical countries and of standards and regulations already established in South America and elsewhere in order to ensure acceptable conditions and control standards that compare favourably and defensibly with those in other dairy industries. Different countries uses of heat stress limits, criteria and indices were investigated as it was necessary to determine to what extent any other indices, limits or criteria would be applicable to tropical conditions. In addition, it was necessary to establish whether there was a single heat stress index that could be used in thermal stress for tropical climatic conditions. It was found that an appropriate combination of heat stress indices would be required in planning for and ultimately controlling thermal conditions in tropical climatic conditions. The solar radiations and humidity being contemplated and the concomitant potential heat hazard present too great a risk for reliance on environmental component of heat stress, such as wet-bulb temperature at present in common use locally. The study recommends that a heat stress index, preferably WBGT be used to design an modern dairy farm's ventilation system and that wet-bulb temperature be used to monitor and control the system once it is implemented.

Keywords: *Tropical, Heat stress limits, Indices, Dairy industry's, Connection, Solar Radiation, , WBGT Index.*

Introduction

Environmental conditions that is conducive to safe and productive for cattle and buffaloes. Although many aspects of a dairy farming environmental conditions would be much the same as those already prevailing in poultry, sheep, goat and other animal farming sector the variations in high metabolic energy requirement to which animal are exposed would increase by virtue of increased depth. The paper therefore offers some guidelines for the use of heat stress indices and limits as would be applicable for dairy farming.

Thermal conditions and the heat stress imposed on animal will be the most significant environmental consequences of dairy farming, indicating a need to quantify the effects of heat on animal health and their production performance. This represents a difference in purpose from the traditional concern with heat stress. The principal motivation in efforts to evaluate and control heat stress in the dairy farm has been to minimize its detrimental effects on animal. This has resulted in the development heat stress indices based same on physiological tolerance and production performance criteria. Given the critical impact that productivity will have on the success or failure of dairy farming criteria should form part of the fundamental basis for determining the thermal standards. In the past, a number of heat stress indices have been devised in attempts to combine various environment variables into a single number indicative of the heat stress imposed on cattle and buffaloes. Although such a number can provide some measure of environmental heat stress, there are many and varied criteria for evaluating the acceptability of thermal conditions for dairy farming.

Heat stress indices

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers.

The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996; West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$

(Bianca, 1962).

$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$

(Bianca, 1962).

$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$

(Thom, 1959).

$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$

(National Research Council, 1971).

$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$

(National Research Council, 1971).

$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$

(National Research Council, 1971).

$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$

(Yousef, 1985a).

Black Globe Humidity Index:

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1076-1079

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1076-1079

Pramod Kumar
Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rishikant
Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rabindra Kumar
Department Of Veterinary Obst. & Gynae. C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

KN Singh
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Mukesh Kumar
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Correspondence
Pramod Kumar
Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

A review: heat stress in cow and buffaloes in India

Pramod Kumar, Rishikant, Rabindra Kumar, KN Singh and Mukesh Kumar

Abstract
India is a tropical climatic country in which heat stress is an important disadvantageous factor that reduces the production performance of cattle and buffalo and conduces to significant decrease in milk yields in dairy cows and buffalo and some metabolically disorders. The objective of this review is to known the heat stress metabolism, its causing factors and its preventative methods for increase the production performance through manage mental and nutritional procedures.

Keywords: Tropical, Heat, Temperature, Conduction, Convection, Radiation, Evaporation, Panting, Sweating, Moisture

Introduction
Climatic conditions of India are such that the hot and humid season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature especially for animal, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance of animal. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003) [20]. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Heat stress is caused by a combination of climatic factors like air temperature, humidity, solar radiation, wind velocity etc. A common time for experience adverse effects of high temperatures is during transport (Fiore *et al*, 2009) [6]. Transport is a multi affected stressor that can create or exacerbate existing heat loads. Handling of animal, increases body temperature. Animal are adversely affected any time the ambient temperature is more than their thermoneutral zone, which ranges about 25°C. Because that heat stress conduces to some disadvantageous affect on livestock, many researchers work about heat stress in animal.

Thermoneutral zone
The Thermoneutral Zone (TNZ) is defined as. "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non evaporative physical processes alone" (Bligh & Johnson, 1973) [3]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal (Silanikove, 2000) [14]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation or acclimatization, level of productivity, housing conditions, insulation, and behavior etc (Yousef, 1985b) [22]. In order to more clearly define the TNZ (Silanikove, 2000) [14] suggested that the subdivision of the TNZ into a zone of thermal well-being is most suitable to describe the relation between an animal and its environment. Figure 1, illustrate this concept.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 273-280

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 273-280
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Exogenous Melatonin and Different photoperiods on Serum Glucose and Total Serum Protein levels in Chhotanagpuri Ewe.

P. K. Choudhary[1*], A. K. Ishwar[2], Bablee Jyoti[3], R. Kumar[4], D. Niyogi[5], M. Kumar[6], P. Kumar[1] and P. K. Maurya[1]

[1]Department of Veterinary Physiology and Biochemistry, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi, India
[3]Department of Chemistry, L.N.M.U., Darbhanga, India
[4]Department of Agronomy (A.H.), B.A.U., Sabour, Bhagalpur, India
[5]Department of Veterinary Pathology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[6]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
**Corresponding author*

Keywords

Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Serum glucose, Total serum protein

ABSTRACT

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. After administration of melatonin, serum glucose was decreased in group- III, IV, VI and VII in comparison to group-I, although this decrease was not statistically significant. An increasing trend of serum glucose was observed in all groups from third to fourth month. Total protein at first month was significantly ($P<0.05$) higher in group VI in comparison to 0 day. After administration of melatonin, total serum protein concentration was significantly ($P<0.05$) decreased in group VI in comparison to first month and continued up to third month. At fifth month, total serum protein was significantly ($P<0.05$) lower in group III, IV and VI in comparison to 0 day and first month.

Introduction

Sheep husbandry is backbone of rural economy in India. The Chhotanagpuri sheep is the only recognized breed of sheep found in Jharkhand with a few numbers in Bihar and West Bengal. This breed is maintained solely for mutton production. They produce coarse wool of poor quality. This is being utilized for carpet manufacturing. Sheep

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF VITAMIN E AND ZINC ON CORTISOL HORMONE DURING PERIPARTUM PERIOD IN CROSS BRED COWS

Pankaj Kumar Maurya[1]*, Anjali Aggarwal[2], P. K. Choudhary[3], Pramod Kumar[4], Gulab Chandra[3], A. K. Singh[4] and Ovais Aarif[5]

[1]C.V.Sc. & A.H., N. D. University of Agri. & Tech., Kumarganj, Ayodhya (UP) India.
[2]Dairy Cattle Physiology Division, NDRI, Karnal (Haryana),
[3]COVAS, SVPUAT, Meerut (U.P.), [4]C.V.Sc. & A.H., Rewa (M.P.), [5]FVSc & AH, SKUAST K

Abstract

The study was conducted to investigate effect of vitamin E and zinc on cortisol hormone during peripartum period in Karan Fries cows. Sixteen pregnant Karan Fries (KF) cows were selected from the herd of National Dairy Research Institute (NDRI) Karnal, on the basis of their body weight, BCS and parity. Eight cows were kept in control group and other eight cows in treatment group which were supplemented with 1000 IU vitamin E and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Cortisol hormone. Body weight and Body condition score (BCS) of all the experimental animals were recorded on the day of blood collection. Plasma cortisol was significantly ($P<0.001$) lower in treatment group as compared to control group (2.98 vs. 3.10 ng/ml). There was a steady increase in the body weight of control and treatment cows towards parturition and was found a significant ($P<0.001$) difference between the control and treatment groups. The body condition score of control and treatment groups decreased by 33.05% and 17.76% respectively after calving. This showed that the control group cows lost significantly ($P<0.001$) more body condition as compared to treatment group cows. The results of this study indicated that supplementation of vitamin E and zinc have beneficial effects in changing cortisol level in this way that improves body condition and decreases the effect of parturition stress in the animals.

Keywords: Cortisol, Body Condition Score, Energy Metabolites, Peripartum period, Vitamin E, Zinc

Introduction

Cortisol is a steroid hormone that helps the body respond to stress. It is also called the stress hormone. It is released in response to stress and low blood glucose concentration. It is the principal glucocorticoid during the reproduction and lactation of cows [1]. Adrenal secretion of cortisol is modulated by a complex negative feedback mechanism involving the central nervous system, hypothalamus, pituitary and adrenals [2]. The synergistic action of endogenous cortisol along with other hormones has been found to be critical for parturition and initiation of lactation in domestic animals [3]. At term the corticosteroid concentration rises in the plasma of peripartum cows [4, 5]. Plasma total cortisol level increased from 2.13 ng/ml to 2.62 ng/ml till one day prepartum and increased to 6.08 ng/ml at parturition in crossbred cows. The level decline from 3.42 ng/ml on 1 day postpartum to 2.49 ng/ml at 3 day postpartum [6]. In Murrah buffaloes level of cortisol was found 1.46 ng/ml at 30 day prepartum which increased to 3.78 ng/ml at parturition and decline to 1.89 ng/ml at 3 day postpartum[7].

Cortisol concentrations have been used as a physiological marker of stress. During heat acclimation there is reduction of plasma cortisol that helps in reduction of heat production of animals[8]. An initial increase in cortisol occurs due to acute heat stress followed by a decline after prolonged exposure in cows. The animals adjust physiologically to elevated heat loads by decreasing adrenal corticoid output [9]. Cortisol concentrations have been found lower in high producing cows at day 30 than at day 90 or in nonlactating cows due to reduced pulse amplitude. Low cortisol concentrations likely participate in the enhanced production observed in high producing cows [10]. Heat exposure at temperature above 40°C has been found to raise the cortisol level to almost double the pre-exposure levels [11]. Similar results were also found by others in hot-dry, hot-humid and winter seasons in crossbred cows (4.17, 4.35 and 2.09 ng/ml respectively) [12].

Materials and Methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). Karnal is situated on an altitude of 250 meter above mean sea level, latitude and longitude position being 29°42" N and 79°54" E respectively. The maximum ambient temperature in summer goes up to 45°C and minimum temperature in winter comes down to 0°C with a diurnal variation in the order of 15-20°C. For the present study 16 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal. 8 cows kept in Control group and other 8 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of vitamin E and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum. Animals were maintained in open area with asbestos roof in the sides of the open area, where the animals were offered feed. The open area had brick floor. The animals were free to move inside the controlled open area. All the animals were fed as per the standard feeding practices followed at the NDRI farm.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6.00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 1,200×g at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Cortisol.

Sample analysis

Blood sample was analyzed for cortisol. Plasma Cortisol was determined by "Cortisol EIA kit" from Cayman Chemical Company, Ann Arbour, USA. Body weight and Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two-way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software.

Results and Discussion

Cortisol

The mean±SE of plasma cortisol concentration of control cows was 2.87±0.09 ng/ml 60 days before calving and on the day of calving it increased to 3.24±0.07 ng/ml. Further, in treatment group the plasma cortisol concentration was 2.78±0.03 ng/ml 60 days before calving and on the day of calving it increased to 3.10±0.03 ng/ml. In present study, the overall mean±SEM of plasma cortisol concentration was found significantly ($P<0.001$, Table 2) lower in treatment group as compared to control group. Plasma levels of cortisol varied between 2.3-3.5 ng/ml during pre and postpartum in Holstein cows [13]. After 7 days of calving it's level started decreasing up to 60 day of lactation.

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON TOTAL LEUCOCYTE COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], P. Kumar[2] D. Niyogi[3] and M. Kumar[4]
[1]Department of Veterinary Physiology and Biochemistry, [2]Department of Veterinary Pathology, [4]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumarganj, Faizabad, U.P.,
[3]Department of Veterinary Physiology, B.V.C., B.A.U., Ranchi.

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. TLC at first month was significantly ($P<0.05$) higher in all short day groups (V, VI and VII) and significantly ($p<0.05$) lower in long day groups (II, III and IV) in comparison to 0 day. After administration of melatonin, TLC was significantly ($p<0.05$) higher in group III, IV, VI and VII in comparison to first month. At third and fourth month TLC was significantly ($P<0.05$) low in group VI and VII in comparison to second month.

Keywords: Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Total leucocyte count

Introduction

Melatonin signaling is necessary for photoperiodic adjustment in immune responses; it is difficult to parse the differential direct effects of melatonin on immune cells from indirect modulatory actions on other neuro-endocrine axes including the systems that control gonadal and adrenal steroids. However, the hypothesis that melatonin acts on immune function via down- stream hormonal effects has not been born out, as gonadectomy and steroid replacement has minimal effect on photoperiodic plasticity in immune system (Prendergast *et al.*, 2005). Further, although androgens tend to be immunosuppressive estrogens often have the opposite effect (Klein, 2008). Therefore, the short-day induced gonadal regression would likely induce opposite effects in males and females if sex steroids were directly responsible for photoperiodic adjustments in immune responses. In general, both males and females respond similarly to changes in day length (Bilbo and Nelson, 2005). Gonadal steroids probably serve to modulate the larger melatonin-mediated effects of day length rather than directly driving photoperiodic changes (Prendergast *et al.*, 2008).

Exogenous administration of melatonin increased the total leucocytic count and lymphocyte percentage in Broiler chicks (Abozahra *et al.*, 1998), Rats (Anwar *et al.*, 1998), and Squirrels (Rai *et al.*, 2006). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17:30 to 18:00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease total leucocyte count and percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in total leucocytic count and lymphocyte percentage is not clear, However, several mechanisms may be involved in this respect.

The major functions of the white blood cells and its differentials are to fight infections, defend the body by phagocytosis against invasion by foreign organisms and to produce or at least transport and distribute antibodies in immune response (Etim, 2015). Thus, animals with low white blood cells are exposed to high risk of disease infection. While those with high counts are capable of generating antibodies in the process of phagocytosis and have high degree of resistance to disease and enhancing adaptability to local environment and disease prevalent conditions (Isaac *et al.*, 2013). As reported by Etim *et al.* (2014[a]) immune status is a function of leucocytes, lymphocytes and Neutrophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine total leucocyte count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36[0]N latitude and 85.33[0]E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty-two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]: - The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]: - In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)] - In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]: - Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]: - Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]: - Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Rams were introduced into each group after completion of exogenous administration of melatonin. Blood samples were collected from each animal day before the start of experiment and there after every month up to fifth month. Blood (0.5ml) was collected from each animal in clean EDTA coated tubes and Total Leucocytes Count ($x\ 10^3/\mu l$ blood) was counted as per

SELECTING A SUITABLE HEAT STRESS INDEX TO PROTECT CATTLE AND BUFFALOES IN HOT AND HUMID CLIMATE

Pramod Kumar[1]*, R. C. Upadyay[2], P.K.Maurya[1], P.K. Chaudhary[1], Nilufar Haque[3], Rajesh Kumar[4], Rabindra Kumar[4] and R.P.Diwakar[5]

[1] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[2] HOD (Ret), Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana, 130001
[3] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., SDAU, Dantiwada, Gujarat-385506
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An assessment of any climate conditions requires extensive measurements to be health and production performance of animal in the climatic zone. This can be labour-intensive, time-consuming and consequently impractical for daily production and comfort assessments of the animals. Therefore, a simple indicator like a heat stress index is needed to enable a quick, valid and acceptable evaluation of animal climatic conditions on a regular basis. This can be explained by the unending quest to develop a "universal index," which has led to the proliferation of many proposed heat stress indices. In this research study is to discuss the selecting a suitable heat stress index for thermal planning and management purposes in hot and humid climatic zone for dairy industries. A method is proposed a defined strategy for selecting and recommending heat stress indices to be used in a particular climatic zone and worldwide based on a heat stress index. The performance of different heat stress indices used in dairy industries and other cattle farm varies based on the climatic conditions and the level of activities. Therefore, carefully selecting or establishing a suitable heat stress index is of paramount importance to ensure the comfort, health and increasing productivity of the cattle and buffaloes. These methods assess and select the most appropriate index for hot and humid climatic conditions to protect the cattle and buffaloes from thermal stress. Although complex, the method presents results that are easy to interpret and understand than any other methods.

Keywords: climatic zone, heat stress index, thermal stress, dairy industries.

Introduction

Heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy [1]. The ability of many indices using these elements have been developed in past; but their utility remained limited. Majority of studies on thermal stress in livestock have used temperature-humidity index (THI). THI represent the combined effect of air temperature and humidity with level of heat stress. Milk yield and DMI exhibited significant declines when maximum THI reached 77. Later research determined that the critical values for minimum, mean, and maximum THI were 64, 72 and 76 respectively [2]. In addition, a climate change scenario was constructed by raising both the minimum and maximum temperatures by 2.76°C, which is a mid-range temperature change for approximate doubling of atmospheric greenhouse gas concentrations. The incidence of stress days as measured by THI greater than 80 has increased significantly over the 40-year period (60%) and the climate change scenarios suggested further, substantial increases (138%) in the frequency of such heat stress days. In addition, in the climate change scenario there was a very marked increase in days where animals could no longer thermo regulate by sweating alone [3]. Different animal species have different sensitivities to air temperature, humidity, solar radiation and wind velocity etc. Cattle and buffaloes have differences in their heat tolerant capacity. Cattle can tolerate high temperatures at low air humidity than buffaloes. This is due to the fact that, cattle can dissipate heat more efficiently by surface evaporation whereas buffaloes use surface evaporation for body cooling to a limited extent.

This research study posed the question of which index can be recommended for a hot and humid climate? In this paper, a method is used to compare a thermal comfort model with some of the most widely used heat indices in dairy industries and another cattle farm. The method is applied to predict the "comfort zone" and to recommend an index based on its production performance as close as possible to the "comfort zone." The comparative analysis uses comfort data including air temperature, airflow velocity, humidity and estimated physiological parameters such as respiration rate and rectal temperature.

Cattle and buffaloes have capacity to maintain their body temperature with in a precise limit even after exposure of environmental extremes [4]. Animals gain heat from three sources: chemical, mechanical and thermal. Chemical and mechanical heat transfer relates to metabolic processes and represents the body's main heat sources. The influence of the thermal environment on an animal is primarily exerted through energy exchanges involving convection, conduction, radiation and evaporation [5]. There are mechanisms by which the body can regulate its core temperature both at rest and during activity, and in both hot and cold or humid environments, along with health risks that are associated with physical activity in the aforesaid environments [6]. Assessment of "Thermoneutral Zone" must start with the maximum production with wellbeing of animal. It is extremely difficult to classify the many factors that affect thermal comfort. The interaction between the physical demands imposed upon an animal his physiological status, and his psychological attitudes. Because thermal comfort is rather subjective and restrictive, it is better to define a Thermoneutral Zone within which most animals will be comfortable. This necessitates the need to define a "zone" in which most of the animals will consider comfortable, the so-called comfort zone. This comfort zone will be ascribed using the climatic and physiological parameteers of the environment and some existing thermal comfort models.

The Thermoneutral Zone (TNZ) is defined as "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non-evaporative physical processes alone [7]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal [8]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation

The idea of the thermal index goes back to 18th century [9]. Without considering the dry-bulb temperature, perhaps the first published heat stress index was the wet-bulb temperature proposed by Haldane [10]. Since then a large number of heat stress indices have been proposed.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 281-285

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 281-285
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of α-Tocopherol Acetate and Zinc Supplementation on Milk Composition in Crossbred Cows

Pankaj Kumar Maurya[1*], Anjali Aggarwal[2], P. K. Choudhary[1], A. K. Verma[1] and Pramod Kumar[1]

[1]College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP), India
[2]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001, Haryana, India
**Corresponding author*

Keywords

Milk composition, Somatic cell count, Transition period, α-tocopherol acetate, Zinc

ABSTRACT

The study was conducted to investigate the effect of α-tocopherol acetate and zinc on milk composition in Karan Fries cows. Twenty pregnant Karan Fries cows were selected two months before expected date of calving. The experimental animals were randomly divided in to two groups namely control group (ten cows) and treatment group (ten cows). Treatment group cows were supplemented with α-tocopherol acetate @ 1000 IU/day/cow and zinc @ 60 ppm/day/cow. Milk fat % was lower in treatment group than control group but the overall fat in treatment group was found significantly higher than control group (4.47±0.20 vs. 3.95±0.27, P<0.01). The overall mean milk protein % was found 3.08±0.04 vs. 3.05±0.11, milk lactose % 4.47±0.08 vs. 4.48±0.10 and SNF % 8.17±0.15 vs. 8.15±0.17 in control group and treatment group, respectively which showed that there was no significant difference between the groups. The overall mean (±SEM) of somatic cell count of milk was found significantly lower (P<0.001) in treatment group than control group. The results of this study indicated that supplementations of antioxidants like α-tocopherol acetate and zinc have beneficial effects in improving quality of milk.

Introduction

For good quality dairy products there is need to know the quality aspects of milk produced. Since the diet is the fastest way to modify the milk production and quality in animals, even if the relations between the feeding and milk composition are quite complex. Trace elements, along with vitamins and minerals, are essential nutrients for cellular metabolism. They are critical components of almost every aspect of how a body grows, develops, functions and reproduces. Vitamin E is crucially involved in immune system function, such that supplementation with supranutritional levels of the vitamin E, results in improved immune responses and milk production (Chawla and Kaur, 2005; Baldi, 2005; Baldi *et al.*, 2008; Chandra and Aggarwal, 2009). There was significant decrease of somatic cell count (SCC) in milk at 15 days of lactation (0.29×10^6 vs. 0.86×10^6) in cows supplemented with 1000 IU vitamin E / day during dry period (Kaur *et al.*, 2002). The somatic cell count is internationally recognized as a parameter for assessing the milk quality and udder health. The present

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

REPRODUCTIVE PERFORMANCE AND ITS VALIDATION EFFECT OF DIFFERENT FEEDING INGREDIENT IN HIGH YIELDING MURRAH BUFFALOES UNDER FIELD CONDITION IN AMBEDKAR NAGAR DISTRICT OF U.P.

Vidya Sagar*, Narendra Raghuvanshiand S.K. Maurya*****
Krishi Vigyan Kendra, Panti, P.O. Mansapur, Distt. Ambedker Nagar,
**Krishi Vigyan Kendra Jaunpur, ** *Deptt. of Vet. Biochemistry,
College of Vet.Sci.and Ani. Husbandry, N.D.Uni. of Agril. And Technology,Kumarganj Faizabad,U.P.

Abstract

The present study was conducted in Ambedkar Nagar district of Uttar Pradesh to establish scientific rational of high yielding buffaloes under field condition, effect of these most common field feeding practices on reproductive performance of Murrah buffaloes under farm condition. The On –Farm Trails were carried out in three different phases designated as Phase I, II and III. In phase-I, collection of data and feed samples from the field, in phase II calculation of chemical composition of feed and fodder samples collected from farmers, and phase III post-partum buffaloes were selected and divided into two groups of each farmers animals in each group, one as a control group (T0) and other one as a treatment group (T1). Control group was fed as per the ICAR (2013) feeding standard and in treatment group feed was offered two times a day 1 hr. before the milking time i.e. 5.00 AM and 4.00 PM and each buffalo were fed 3 kg gram chuni, 1.5 kg oil seed cake, 1.5 kg wheat dalia, 10 kg Berseem green fodder and 2 kg wheat straw in each time for 3 month. Significant results were found in the treatment group i.e. the lesser service period ($p < 0.05$) and lower services per conception ($p<0.01$) compared to control group. There was higher conception rate in treatment group (83.33%). It's clearly indicated that the feeding of higher energy and protein in the ration, results in buffaloes of treatment group was bred earlier, lower service per conception and higher conception rate.

Key words: Murrah buffaloes, Reproductive performance, Service period, Services per conception.

Introduction

India possesses great potential in animal husbandry sector being the largest milk producing country in the world with a production of about 97.1 million tons (14.9% of world, CSO, 2006). Our country also has the largest buffalo population, while we stand second in cattle population after Brazil. The per capita availability of milk has increased from 112 gm in 1970 to 241gm in 2005-06 (CSO, 2006). High milk yield during early lactation of the buffaloes create a challenge in meeting the animals' energy requirements. This period is characterized by a substantial decline in feed intake lipid mobilization leading to elevated plasma NEFA and hepatic triglycerides (TRG) content and protein mobilization. The resulting negative energy balance impairs reproduction. Post-partum fertility has a profound impact on the economic viability of dairy industry. Among various factors, peri-parturient disorders have been recognized as the most important factors influencing fertility. Lowered reproductive performance concomitant to steadily increasing milk production is a main concern for dairy industry world over. Numerous studies have reported that reproductive performance is compromised, primarily through delayed ovarian activity and reduced conception rates, by the demands of high milk yield (Nebel and MsGilliard, 1993; Beam and Bulter, 1999). Improved reproductive performance and reduced incidence of reproductive disorders, in order to resume normal fertility after parturition, adequate balance of protein, energy, trace minerals and antioxidant vitamins must be maintained after parturition. High level of concentrate feeding to buffaloes decreased the incidence of reduced days to first observed estrus and decreased services/conception (Jukola *et al.*, 1996; Kim *et al.*, 1997).

Materials and Methods

On–Farm Experiments were conducted by KVK Ambedkar Nagar in six villages, two each from blocks -Katehari and Jalalpur and Tanda on twelve farmers of district Ambedkar Nagar of Uttar Pradesh. Twenty-four buffaloes (≥18 liters milk) were identified and their owners interviewed to get the required information, Samples of feed and fodder offered to animals were collected and calculated for proximate principles as per (AOAC (1995). The chemical composition of feed and fodders is presented in Table-1. The DM content was lowest in green berseem (16.24%) among all green fodders, it might be due to succulent nature. The CP content in roughages was highest in berseem (16.47%) fallowed by multicut chari (11.52%) and sorghum (11.52%), while it was least in paddy straw (2.10%). The value is close agreement with those reported by Mudgal et al. (2003). The contrite mixture was mainly prepared incorporating locally available ingredients like rice bran, mustard cake, pigenpea and gram chunni, wheat bran, wheat grain etc., but most of farmers used these concentrate ingredients in adequate amount, some more or less. Some farmers were also aware to feed commercial concentrate like complete feed pullet to animals. Mustard cake contained high CP (37.12%) as compared to other concentrate ingredients, whereas EE content was highest in rice bran (12.78%). The ash content was found to be highest in rice bran (22.16%) fallowed by berseem green (20.22%).

Table -1 Chemical composition of feeds and fodders (% on DM basis)

S.N.	Feeds/ fodders	DM	CP	CF	NFE	EE	Total Ash
1.	Rice bran	92.42	12.30	14.58	38.90	12.78	22.16
2.	Mustard cake	91.87	37.12	9.35	37.16	9.81	08.59
3..	Pigeon pea chunni	92.64	18.70	17.20	53.55	2.30	08.02
4.	Gram chunni	92.25	12.47	38.62	42.10	1.62	04.86
5.	Wheat bran	93.31	16.29	7.76	67.81	3.35	04.78
6.	Wheat grain	92.28	10.34	4.69	80.52	2.45	02.46
7.	Paddy straw	92.20	2.10	37.59	42.97	0.85	16.39
8.	Wheat straw	93.67	3.04	38.18	48.19	1.02	16..81
9.	Sorghum green	18.27	9.42	26.88	48.82	2.34	11.86
10.	Berseem green	16.24	16.47	25.96	35.78	2.64	20.22
11.	Multicut chari	17.86	11.52	27.20	47.49	4.37	10.15

After collection of data, the amount of daily DM (Dry matter), DCP (Digestible crude protein) and TDN (Total digestible nutrients) intakes were calculated from the feed intake on the basis of average nutritive values(Table -2) of the feed and fodders (Rajhan, 2001).Length and Heart girth of each animal was measured to calculate the body weight. The collected data were made into tabular form through the various calculating process. To study the nutritional requirement of the buffaloes and body weight of the animals were calculated by using Shaeffer's formula (Sastry *et al.*, 1982): Body weight (kg) = {[(Heart girth in inches)2 × (length of body in inches)]

Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1369-1372

Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P. India

Abha Singh
Professor, Department of Family Resource Management, College of Home Science NDUAT, Kumarganj, Uttar Pradesh, India

Correspondence
Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P. India

Assessment of occupational health hazards among farm workers involved in agricultural activities

Pragya Ojha and Abha Singh

Abstract
Indian Farm workers are highly involved in various agricultural operations. They perform a sequential work through manual efforts. In the present investigation efforts have been made to assess the occupational risk related to various agriculture activities and to compare the physical strength of male and female farm workers, during manual method to perform agricultural operations. For the study, twenty female and twenty male subjects were selected. From this study, it has been recommended that there is dire need to create awareness among the farm workers about the low cost improved technologies related to flower cultivation which can significantly improve the livelihood security and working conditions of farm workers. It will also reduce the level of occupational risk and enhance the physical strength of the workers.

Keywords: Occupational risk, Physical strength, Agricultural Workers, Agricultural Activity

Introduction
In the context of occupational safety and health, the term 'agriculture' is generally used in a broad sense including all activities directly related to cultivating, growing, harvesting and primary processing of agricultural products, animal and livestock breeding including aquaculture, and agroforestry. Agricultural work is dangerous; workers in this industry have among the highest rates of fatalities (BLS, 2014 and Liebman *et al.* 2013). Furthermore, Wang *et al.* (2013) also mentioned that work in agriculture involves exposures to a variety of hazards, including dust, noise, thermal stress, pesticides and other chemicals, and ergonomic risk factors. As a result, agricultural workers have elevated rates of injuries and illnesses. Das *et al.* (2011) also supported that agricultural works are associated with several occupational disorders among the farmers and agriculture farming involves several types of hazardous activities including prolonged and awkward postures. Agriculture workers perform many strenuous activities. These are: spading, carrying seeds, uprooting, transplanting saplings, harvesting or cutting crops, shelling, carrying crops, threshing, sweeping and winnowing. Therefore, the main aim of this investigation was to know the level of occupational health hazards among agriculture workers and an attempt was made to compare the physical strength of male and female farm workers during the performance of work.

Materials and Method
Selection of subject and field
From Faizabad district of Uttar Pradesh state, India, twenty male and twenty female subjects with normal health, without any major illness or cardio-vascular problems were purposively selected because only without illness or cardio- vascular problems, agricultural workers can perform the activities more efficiently. This study was conducted in the month of February-August in the year of 2016. The age range of the selected subjects was 20-55 years. Care was taken to select the female farm workers who were non pregnant and who can perform the agricultural activities regularly. The agricultural operations were performed for 7:00 A.M to12:30 P.M. and 2:00 P.M. to 5:30 P.M. Agriculture workers performed the continuous agriculture operations for 50 minutes and taking 10 minutes break.

Calibration of subjects: The subjects were calibrated with the Body Mass Index to determine their physical fitness index. The body mass index of subjects was calculated by dividing square of height (m2) to weight (kg).

Quantification of safety and Health Hazards
Semi quantitative observational tool to characterize safety and health hazards developed by Neitzel *et al.* (2014) has been used to quantify the level of safety and health hazards among

Scanned with CamScanner

7:02 IJMRA-12885.pdf

International Journal of Research in Social Sciences
Vol. 7 Issue 12, December 2017,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

ASSESSMENT OF MUSCULO-SKELETAL DISORDER IN FLOWER PLUCKING WOMEN IN FAIZABAD DISTRICT OF UTTAR PRADESH

MANEESHA MISHRA *
Dr. ABHA SINGH **

ABSTRACT

Women play a significant and crucial role in Agriculture development, livestock production and Floriculture as a manager decision maker and skilled farm worker. In this study attempt has been made to study the role performed by farm women engaged in floriculture and to find out the MSD (Musculoskeletal disorder) and OH (Occupational Hazard) among women. The study was conducted in Faizabad District in U.P. 100 samples were taken of women involved in flower management. It was found from the study that majority of respondents (40%) suffered from the Back pain while (20%) women suffered Knee pain. The analysis of the study shows that Poor postures and finger nodes. Stress full work, unawareness of new techniques in the use of equipment and unwariness for safety measures were the reason for musculoskeletal discomforts. 70% women used foot wears due to the awareness of the advantages of it. The preferred activities by women were grading of flower (42%) as first followed by Deeping of flowers (34%), plucking of flower (12%) and storage flower (11%) respectively. The study will be use full in policy making designing women friendly implements for flower plucking and right posture training.

Key word: MSD (Muscule-Skeletal Disorder), Occupational Hazard, Knee pain, Back pain, Musculoskeletal Disorder.

* Research Scholar, Department of Home Science, Family Resource Management, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad-211007, U.P., India.

** Associate Professor Department of Home Science, Family Resource Management, Narendra Deva University of Agriculture & Technology Narendra Nagar (Kumarganj, Faizabad (U.P)

Scanned with CamScanner

The Pharma Innovation Journal 2022; SP-11(2): 376-380

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(2): 376-380
© 2022 TPI
www.thepharmajournal.com
Received: 28-12-2021
Accepted: 30-01-2022

Abha Singh
College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Pragya Ojha
SMS Krishi Vigyan Kendra, Banda University of Agriculture & Technology, Banda, Uttar Pradesh, India

Sumant Pratap Singh
SRF, Department of Crop Physiology, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Namita Joshi
Dean, College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Abha Singh
College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Income generation for sustainable development of rural women

Abha Singh, Pragya Ojha, Sumant Pratap Singh and Namita Joshi

Abstract
Women constitute about 50% of total population, yet their status in the society pitiable. They put in 15 hours of work daily but their wages are less than men. The income generation activities undertaken by women are yet to prove its impact on them or it is more a self employment activity rather than a substantial source of income. Therefore there is a need to study if these micro income generating activities provide empowerment to rural women. The objective of this study is to find out if income generating activities under taken by rural women have increased their participation in decision making process. In this study income generating activity has been treated as independent variable and women empowerment as dependent variable. The study was conducted in Sultanpur district of Uttar Pradesh (U.P.) and both income generating and non income generating 150 women from each group were selected as sample. The pace of empowerment may be due to small amount of income generated. As a result of this, U.P. (Uttar Pradesh) government initiated several projects. Under this scheme women are encouraged to undertake some income generating programmes to raise their income which will their self confidence, bargaining power, promote stronger household food security and investment in children's schooling. From review paste researchers and personal experiences the following model is designed to show how women empowerment takes place. A similar model was tested by Estudillo and Esatka 1988, but model differs in measuring empowerment in terms of women participation in decision making. The study revealed that income earned by women has improved their status and empowerment is taken place but the speed of empowerment is slow..

Keywords: decision making, society, economic, farming, labor, village

Introduction
It is paradoxical that women constitute nearly 50 percent of world population and yet their social economic and welfare status is pathetic. Even today only a fraction of rural women are educated and majority is living under poverty, ignorance, and oppression. They still lack the access to information, science and technology, economic resources, political power and employment avenues. Their employment opportunities are dismal. What ever improvement in women employment is being claimed, it is mostly among urban women while rural women are still far behind and living in poor condition. The activity profile of women reveals that they put in 15 hours of work daily and yet their wages are lower than men. Besides this, they contribute nearly 50 to 70 percent of agricultural labour in farming and when working on own farm they are not paid. Although when they work as a labour on the farm of other farmers, they are paid less wages compared to men. The world community is aware of rural women's plight and four world conferences have been organized and truck load of resolutions have been passed. As a result of this, U.P. (Uttar Pradesh) government initiated several projects, notably DWACRA (Development of Women and Children of Rural Areas). Under this scheme women are organized in self help groups and are encouraged to undertake some income generating programmes to raise their income which will raise their self confidence, bargaining power, promote stronger household food security and investment in children's schooling. According to Cornelia Butler Flora Rural women help in income generation either by earning or by saving.

Critical analysis of the studies reflects that income generation activity should be encouraged for empowering the women. However none of these studies clearly state that the impact of income generation is positive and it has empowered the women. The major issue is how empowerment has been measured in these studies. Therefore, in this study women participation in various decisions making has been measured as an empowerment.

The second aspect which is yet to be tackled is the feeling of improvement of income and

The Pharma Innovation Journal 2021; 10(6): 1145-1148
www.ThePharmaJournal.com
The Pharma Innovation
ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(6): 1145-1148
© 2021 TPI
www.thepharmajournal.com
Received: 17-03-2021
Accepted: 23-04-2021

Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashok Kumar
Associate Professor & Head, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhinav Kumar
Ph.D, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of integrated nutrient management on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) Cv. Bidhan Marigold-2

Laxmi Kant, Ashok Kumar and Abhinav Kumar

Abstract
A field experiment was carried out to study the effect of integrated nutrient management on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) Cv. Bidhan Marigold-2 at Main Experimental Station, Department of Floriculture and Landscape, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) during the summer season of 2018-19 and 2019-20. The experiment was laid out in Randomized Block Design with16 treatment combinations replicated thrice to assess the effect of *Azospirillum*, PSB, FYM, Vermi-compost, Poultry manure and NPK (Recommend Dose of Fertilizers).
Results reveal that the application of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermi compost @ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) left the significant response on vegetative growth and flowering of African marigold Cv. Bidhan Marigold-2. The treatment has resulted in maximum plant height, number of primary branches plant^{-1}, spread of plants, stem diameter at 30 days, earlier days to first bud initiation, days taken to flower bud opening, days taken to 50% flowering and maximum duration of flower in the field. Based on above results, it is concluded that the use of treatment combinations of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermicompost@ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) on African Marigold Cv. Bidhan Marigold-2 are beneficial for the growers of Eastern Uttar Pradesh.

Keywords: Marigold, *Tagetes erecta* L., nutrient management, Azospiriillum, PSB, vermi-compost etc.

Introduction
African Marigold is an important commercial flower of India that belongs to the family Asteraceae (Composite). Marigold is a native of Central and South America especially Mexico. It also called 'Gainda' in the Hindi language. The genus *Tagetes* contain around 33 species, African marigold (*Tagetes erecta* L., 2n = 24) and French marigold (*Tagetes patula* L., 2n = 48) announced by (Rydberg, P. A., 1915) [8].
African marigold is one of the most important hardy flower crops which are grown commercially in different parts of the worlds. Marigold gained popularity among garden and flower dealers on account of its easy cultivation, wide adaptability of diverse soil and climatic conditions, the habit of profuse flowering, short duration to produce marketable flowers, and good keeping quality. In India, it is one of the most commonly grown loose flowers and extensively used on religious and social functions, in one form or another.
Agriculture, which largely depends on continuous use of chemical fertilizer is not only a burden for the farmer's or growers but is also responsible for the depletion of soil fertility which often affects productivity. Hence, efficient and judicious use of chemical fertilizers along with organic manure is imperative not only for obtaining more yields per unit area on a sustainable basis but also to conserve the energy and to avoid the problem of environmental quality.
Bio-fertilizers are the products containing living cells of different types of microorganisms, which are capable of mobilizing nutritive elements from non-usable form to usable form through a biological process. Azotobacter and PSB are free-living bacteria that help in N_2 fixation and solubilizing phosphorus in the soil. Nitrogen is an important metabolic element for the growth and development of the plant. It is essentially considered as metabolic activities, the transformation of energy, essential for the metabolism of protein and other biochemical product such as nucleic acid, chlorophyll and protoplasm. Phosphorus is the essential component of protoplasm and chlorophyll which caused conversion of photosynthesis into phospholipids resulting in adequate vegetative growth of the plant.

The Pharma Innovation Journal 2022; 11(6): 827-830

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(6): 827-830
© 2022 TPI
www.thepharmajournal.com
Received: 01-02-2022
Accepted: 08-05-2022

Anshuman Singh
Research Scholar, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashok Kumar
Associate Professor, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhinav Kumar
Assistant Professor, Department of Horticulture, Bhagwant University, Ajmer, Rajasthan, India

Corresponding Author:
Anshuman Singh
Research Scholar, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on the effect of bio-inoculants and gibberellic acid on vegetative growth of African marigold (*Tagetes erecta* L.) Cv. Pusa Narangi Gainda

Anshuman Singh, Ashok Kumar and Abhinav Kumar

Abstract
A field experiment was carried out to study the effect of bio-inoculants and Gibberellic acid on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gainda" at the Main Experiment Station, Department of Floriculture & Landscape, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.) during the years 2019-20 and 2020-21. The experiment was conducted in Randomized Block Design (Factorial) with 12 treatments replicated thrice to assess the effect Bio-Inoculants and Gibberellic Acid on Vegetative Growth of African Marigold. Results reveal that the application of Azotobacter by soil treatment 4L/ha and Gibberellic acid 200 ppm had left significant response on the growth of marigold. The maximum plant height, primary branches per plant, secondary branches per plant, plant spread, Plant basal diameter was obtained with the combination application of A_3 (Azotobacter by soil treatment 4L/ha) and G_4 (Gibberellic acid 200 ppm) whereas the minimum values were recorded in control. Interaction effect of both the treatment was found non-significant.

Keywords: Azotobacter, gibberellic acid, growth, flowering, marigold

Introduction
African marigold (*Tagetes erecta* L.) is one of important annual flower known for its aesthetic value and long blooming period. It belongs to family Asteraceae, a native of Central and South America especially Mexico. In India marigold was introduced by the Portugeses (Kalpan, 1960) [4]. In India, the present area under marigold cultivation is 55890 ha with a production of 5.1 lakh MT. Karnataka is the largest state in area of marigold in India with production of 74,900 MT from an area of 9100 ha. Madhya Pradesh ranks first in production (85,070 MT) from an area of 7780 ha.

Marigold can be grown in all seasons of which rainy and winter season crops are the main crops under eastern U.P. condition. The name genus *Tagetes* was derived from Etruscan *Tagetes* which refers to the ease with which plants of the genus come out each year either by seeds produced in the previous year, or by the stems which regrow from the stump already in place. The most commonly cultivated species of *Tagetes* are known variously as African marigold (*Tagetes erecta*), French marigold (*Tagetes patula*), Signet marigold (*Tagetes tenuifolia*) and mini marigold (*Tagetes minuta*).

The plants of Mexican marigold reach heights of between 50 and 100 cm. The root is cylindrical with fibrous and shallow branching system. The stem is striated, sometimes ridge, smooth or slightly with villi, cylindrical, oval and herbaceous to slightly woody, with resin channels in the bark, which are aromatic when squeezed. Opposite leaves at the bottom alternate at the top, up to 20 cm long, pinnate, composed of 11 to 17 leaflets, lanceolate to linear-lanceolate, up to 5 cm long and 1.5 cm wide, acute to acuminate, serrated to sub-holders, the lower ones of each leaf frequently setiform (in the form of threads), the superiors are sometimes completely setiform; with abundant round glands.

Microbial inoculants of selective micro-organisms like azotobacter which is free-living nitrogen fixing bacteria, help in improving soil fertility by the way of accelerating biological nitrogen fixation from atmosphere nearly 25 to 30 l nitrogen per hectare, solubilization of the insoluble nutrient in soil, generate little quantity of PGRs decomposing plant residues and stimulating plant growth and production by producing Phyto hormones, enhancing the uptake of plant nutrients by plant roots and thus help in sustainable crop production through maintenance of soil productivity.

The Pharma Innovation Journal 2021; 10(6): 1149-1153

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(6): 1149-1153
© 2021 TPI
www.thepharmajournal.com
Received: 20-03-2021
Accepted: 25-04-2021

Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashok Kumar
Associate Professor, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Jitendra Kumar
Research Scholar, Department of Vegetable Science, College of Horticulture and Forestry, A.N.D.U.A. &T., Kumarganj, Ayodhya, Uttar Pradesh, India

Nishakant Maurya
Research Scholar, Department of Vegetable Science, College of Horticulture and Forestry, A.N.D.U.A. &T., Kumarganj, Ayodhya, Uttar Pradesh, India

Mohit Lal
Research Scholar, Department of Vegetable Science, College of Horticulture and Forestry, A.N.D.U.A. &T., Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

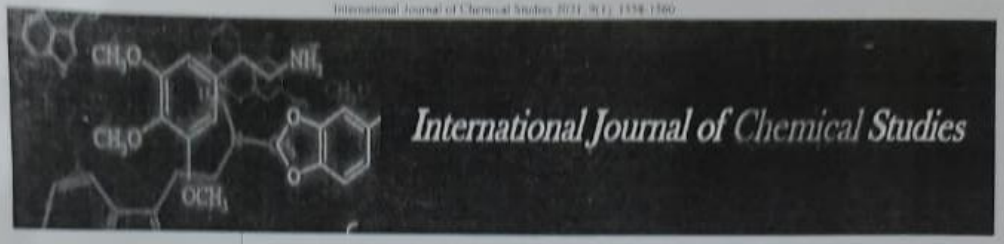
Effect of integrated nutrient management on flower yield of African marigold (*Tagetes erecta* L.) cv. Bidhan Marigold-2

Laxmi Kant, Ashok Kumar, Jitendra Kumar, Nishakant Maurya and Mohit Lal

Abstract
A field experiment was carried out to study the effect of integrated nutrient management on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) Cv. Bidhan Marigold-2 at Main Experimental Station, Department of Floriculture and Landscape, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) during the summer season of 2018-19 and 2019-20. The experiment was laid out in Randomized Block Design with16 treatment combinations replicated thrice to assess the effect of *Azospirillum*, PSB, FYM, Vermi-compost, Poultry manure and NPK (Recommend Dose of Fertilizers).
Results reveal that the application of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermicompost@ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) left the significant response on flower yield of African marigold Cv. Bidhan Marigold-2. The treatment has resulted in maximum number of flower per plant, flower yield plat^{-1}, flower yield plot^{-1}, flower yield ha^{-1}, and120:60:60 kg NPK (Recommend Dose of Fertilizers) left the significant response maximum number of cut flower plant^{-1}, number of cut flower ha^{-1}. Based on above results, it is concluded that the use of treatment combinations of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermicompost@ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) and 100% NPK (Recommend Dose of Fertilizers)on African Marigold Cv. Bidhan Marigold-2 are beneficial for the growers of Eastern Uttar Pradesh.

Keywords: Marigold, *Tagetes erecta* L., flower yield, nutrient management, *Azospirillum*, PSB, vermi-compost etc.

Introduction
African marigold is an important commercial flower of India that belongs to the family Asteraceae (Composite). Marigold is a native of Central and South America especially Mexico. It also called 'Gainda' in the Hindi language. The genus *Tagetes* contain around 33 species, African marigold (*Tagetes erecta* L., 2n = 24) and French marigold (*Tagetes patula* L., 2n = 48) announced by (Rydberg, P. A., 1915) [18].
African marigold is one of the most important hardy flower crops which are grown commercially in different parts of the worlds. Marigold gained popularity among garden and flower dealers on account of its easy cultivation, wide adaptability of diverse soil and climatic conditions, the habit of profuse flowering, short duration to produce marketable flowers, and good keeping quality. In India, it is one of the most commonly grown loose flowers and extensively used on religious and social functions, in one form or another.
Agriculture, which largely depends on continuous use of chemical fertilizer is not only a burden for the farmer's or growers but is also responsible for the depletion of soil fertility which often affects productivity. Hence, efficient and judicious use of chemical fertilizers along with organic manure is imperative not only for obtaining more yields per unit area on a sustainable basis but also to conserve the energy and to avoid the problem of environmental quality.
Bio-fertilizers are the products containing living cells of different types of microorganisms, which are capable of mobilizing nutritive elements from non-usable form to usable form through a biological process. Azotobacter and PSB are free-living bacteria that help in N_2 fixation and solubilizing phosphorus in the soil. Nitrogen is an important metabolic element for the growth and development of the plant. It is essentially considered as metabolic activities, the transformation of energy, essential for the metabolism of protein and other biochemical product such as nucleic acid, chlorophyll and protoplasm.



P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; 9(1): 1558-1560
© 2021 IJCS
Received: 22-11-2020
Accepted: 30-12-2020

Rahul Pal
Department of Fruit Science, Acharya Narendra Deva University of Agriculture & Technology, Faizabad Ayodhya, Uttar Pradesh, India

Ashok Kumar
College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture & Technology, Faizabad Ayodhya, Uttar Pradesh, India

Abhinav Kumar
College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture & Technology, Faizabad Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rahul Pal
Department of Fruit Science, Acharya Narendra Deva University of Agriculture & Technology, Faizabad Ayodhya, Uttar Pradesh, India

Effect of foliar feeding on chemical attributes of Ber (*Ziziphus mauritiana* L.) under Sodic soil

Rahul Pal, Ashok Kumar and Abhinav Kumar

DOI: https://doi.org/10.22271/chemi.2021.v9.i1y.11446

Abstract
An experiment was carried out to study the "Effect of foliar feeding on chemical attributes of ber (*Ziziphus mauritiana* L.) Under sodic soil" in the year 2019-20. The experiment was conducted in Randomized Block Design with three replications. The foliar feeding of urea (2.0%), zinc sulphate (0.50%), borax 0.50% and K_2SO_4 0.50% a at peak flowering, peanut size of fruit and second growth phase significantly increased the fruit quality characteristics T.S.S. (20.86° Brix), Total sugars (9.58%), Reducing sugar (6.68%), Non- reducing sugar (2.90%), Acidity (0.25%), Ascorbic acid (95.66 mg/ 100 g pulp), Fruit yield per plant (33.63 kg/plant) and Fruit yield (9.37 t/ha.) over control. The maximum effect on all parameters, treatment T_{10} was observed best with the feeding of Urea 2.0% + $ZnSO_4$ 0.50% + Borax 0.50% + K_2SO_4 0.50%.
However, the combination of Urea 2.0% + $ZnSO_4$ 0.50% + Borax 0.50% + K_2SO_4 0.50% was found most effective in fruit quality of ber (*Ziziphus mauritiana* L.) under sodic soil.

Keywords: Foliar, chemical, attributes, Sodic, *Ziziphus mauritiana* L.

Introduction
The Indian Ber (*Ziziphus mauritiana* L.), which is also called Chinese date or Chinese fig, belongs to family Rhamnaceae and genus *Ziziphus*. It is tetraploid in nature with a chromosome number 2n=4x=48. Origin of ber is said to be India to south –western Asia. It is a drought hardy and can grow under the most hazardous condition of soil, water and climate and thus it has highly recommended for the arid and desert area of India. The cultivated area of ber increased due to better adoptability and higher return in arid, semiarid and irrigated areas. It is also known as "King of Arid Fruits".
Commercial cultivation usually extends up to 1000 m above sea level. It is known for its ability to withstand adverse conditions, such as salinity, drought and water logging. It has also been mentioned in holy books like Ramayana and Mahabharata. In India, area under ber is 49 million hectare and production consists of 481 million tonne 2017-18. In view of the recent development in production technology of this crop, the cultivation of ber crop is becoming increasing popular in many parts of India such as Rajasthan, Haryana, Uttar Pradesh, Gujarat, Madhya Pradesh, Bihar, Maharashtra, Andhra Pradesh and Tamil Nadu. It is reported to grow in other countries like Iran, Syria, Australia, USA, France and some parts of Italy, Spain, and Africa etc.
Gola is an early variety and popular in Delhi, Haryana, Uttar Pradesh and other adjoining areas. Among the different cultivars of ber, Gola is an extremely drought hardy, early and extensively grown variety. The fruit is ovate to round in shape and the size of fruit is medium. It develops greenish to golden yellow colour at ripening stage. The quality of fruit is excellent but cannot stand long transport. The average weight of fruit varies from 15-20g.
Foliar feeding of nutrients has certain advantages over soil feeding. Foliar feedings are highly effective with rapid pant response and also useful to maintain their optimum concentration in the plant during growth and fruit development. But very scanty information is available on foliage nutritional aspects, which can be valuable in making judicious fertilizer recommendation for profitable production of ber. The foliar feeding of fruit trees has gained much importance in recent years, as fertilizers applied through soil are needed in higher quantities because some amounts leach down and some amounts become unavailable to the plants due to complex soil reaction.

The Pharma Innovation Journal 2021; 10(6): 1145-1148

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(6): 1145-1148
© 2021 TPI
www.thepharmajournal.com
Received: 17-03-2021
Accepted: 23-04-2021

Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashok Kumar
Associate Professor & Head, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhinav Kumar
Ph.D, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Laxmi Kant
Research Scholar, Department of Floriculture and Landscape, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of integrated nutrient management on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) Cv. Bidhan Marigold-2

Laxmi Kant, Ashok Kumar and Abhinav Kumar

Abstract
A field experiment was carried out to study the effect of integrated nutrient management on vegetative growth and flowering of African marigold (*Tagetes erecta* L.) Cv. Bidhan Marigold-2 at Main Experimental Station, Department of Floriculture and Landscape, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) during the summer season of 2018-19 and 2019-20. The experiment was laid out in Randomized Block Design with16 treatment combinations replicated thrice to assess the effect of *Azospirillum*, PSB, FYM, Vermi-compost, Poultry manure and NPK (Recommend Dose of Fertilizers).
Results reveal that the application of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermi compost @ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) left the significant response on vegetative growth and flowering of African marigold Cv. Bidhan Marigold-2. The treatment has resulted in maximum plant height, number of primary branches plant^{-1}, spread of plants, stem diameter at 30 days, earlier days to first bud initiation, days taken to flower bud opening, days taken to 50% flowering and maximum duration of flower in the field. Based on above results, it is concluded that the use of treatment combinations of *Azospirillum* @ 250 ml/ha + PSB @ 250/ha ml + Vermicompost@ 50 q/ha + 50% NPK (Recommend Dose of Fertilizers) on African Marigold Cv. Bidhan Marigold-2 are beneficial for the growers of Eastern Uttar Pradesh.

Keywords: Marigold, *Tagetes erecta* L., nutrient management, Azospirillum, PSB, vermi-compost etc.

Introduction
African Marigold is an important commercial flower of India that belongs to the family Asteraceae (Composite). Marigold is a native of Central and South America especially Mexico. It also called 'Gainda' in the Hindi language. The genus *Tagetes* contain around 33 species, African marigold (*Tagetes erecta* L., 2n = 24) and French marigold (*Tagetes patula* L., 2n = 48) announced by (Rydberg, P. A., 1915) [8].
African marigold is one of the most important hardy flower crops which are grown commercially in different parts of the worlds. Marigold gained popularity among garden and flower dealers on account of its easy cultivation, wide adaptability of diverse soil and climatic conditions, the habit of profuse flowering, short duration to produce marketable flowers, and good keeping quality. In India, it is one of the most commonly grown loose flowers and extensively used on religious and social functions, in one form or another.
Agriculture, which largely depends on continuous use of chemical fertilizer is not only a burden for the farmer's or growers but is also responsible for the depletion of soil fertility which often affects productivity. Hence, efficient and judicious use of chemical fertilizers along with organic manure is imperative not only for obtaining more yields per unit area on a sustainable basis but also to conserve the energy and to avoid the problem of environmental quality.
Bio-fertilizers are the products containing living cells of different types of microorganisms, which are capable of mobilizing nutritive elements from non-usable form to usable form through a biological process. Azotobacter and PSB are free-living bacteria that help in N_2 fixation and solubilizing phosphorus in the soil. Nitrogen is an important metabolic element for the growth and development of the plant. It is essentially considered as metabolic activities, the transformation of energy, essential for the metabolism of protein and other biochemical product such as nucleic acid, chlorophyll and protoplasm. Phosphorus is the essential component of protoplasm and chlorophyll which caused conversion of photosynthesis into phospholipids resulting in adequate vegetative growth of the plant.

The Pharma Innovation Journal 2022; 11(6): 823-826
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(6): 823-826
© 2022 TPI
www.thepharmajournal.com
Received: 13-04-2022
Accepted: 30-05-2022

Anshuman Singh
Research Scholar, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashok Kumar
Associate Professor, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Anshuman Singh
Research Scholar, Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on the effect of bio-inoculants and gibberellic acid on flowering of African marigold (*Tagetes erecta* L.) cv. Pusa Narangi Gainda

Anshuman Singh and Ashok Kumar

Abstract
The present investigation was carried out to "Studies on the effect of bio-inoculants and Gibberellic acid on flowering of African marigold (*Tagetes erecta* L.)" at the Main Experiment Station, Department of Floriculture & Landscape, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during winter season in the year 2019-2020 and 2020-21. The experiment was conducted in Randomized Block Design (Factorial) with 12 treatments replicated thrice to assess the effect Bio-Inoculants and Gibberellic Acid on flowering attributes of African Marigold.
During the investigation, the treatment A_3G_4 (Azotobacter by soil treatment 4L/ha and Gibberellic acid 200 ppm) has given the maximum beneficial effect on the flowering parameters (days to first bud initiation (40.67, 38.67 days), days to first flowering(50.67, 49.00 days), days taken 50% flowering (63.00, 61.33 days), duration of flowering (54.00 and 55.00 days), length of flower stalk (8.67,9.33cm), number of flowers per plant (55.33, 56.33) fresh weight of flower (10.89, 11.33 g), dry weight of flower (0.98, 0.98) and flower diameter (7.89, 8.00 cm) during winter season in the year 2019-2020 and 2020-21 as compared to individual application of GA_3 and Azotobacter treatments but their interaction effect was found non-significant.

Keywords: Bio fertilizer, plant growth regulators, growth, marigold

Introduction
The African marigold (*Tagetes erecta* L.) is a popular annual flower that is prized for its beauty and extended blooming period. It is a member of the Asteraceae family and is endemic to Central and South America, particularly Mexico. The Portuguese introduced marigold to India (Kalpan, 1960) [7]. The current marigold growing area in India is 55890 ha, with a production of 5.1 lakh MT. Karnataka has the highest marigold production in India, with 74,900 MT produced from a 9100 ha area. From a total area of 7780 hectares, Madhya Pradesh produces the most (85,070 MT).
Marigold grown in all seasons, rainy and winter crops being the most common in eastern Uttar Pradesh. The name *Tagetes* comes from Etruscan Tagetes, which refers to the ease with which the genus' plants emerge each year, either from seeds generated the previous year or from stems that renew from the stump already in place. African marigold (*Tagetes erecta*), French marigold (*Tagetes patula*), Signet marigold (*Tagetes tenuifolia*), and tiny marigold (*Tagetes tenuifolia*) are the most commonly cultivated Tagetes species (*Tagetes minuta*).
Marigold has numerous applications. Marigold is a multipurpose crop that yields a brilliant harvest. It's widely grown as a loose bloom throughout India. The loose flowers are used to make garlands, baskets, and veni, among other things. The petals are frequently used to create unique greeting cards, stationary, envelopes, and corporate gifts by embedding them in handmade paper. It's also utilized as a flavouring agent in a variety of bread goods, dairy products, yoghurt, and ice cream, and its powder and extracts have been allowed for use as sole colourants in chicken feed. Marigolds have also been identified as a food plant for some Lepidoptera caterpillars, such as the dot moth, as well as a nectar source for other butterflies. Marigold is a highly successful nematode control crop when used as a trap crop for nematode (*Helicoverpa armigera*) management in tomato fields. Marigold is becoming a more important commercial source of carotenoid pigments. The primary pigment in the flowers is xanthophyll, of which lutein accounts for 80 to 90% in the form of palmitic and myristic acid esters. Tagetes oil is an aromatic oil derived from *Tagetes minuta* that is used as a fly repellant and has larvicidal qualities. Mexican marigold plants grow to be between 50 and 100 cm tall.

The Pharma Innovation Journal 2021; 10(12): 2929-2931

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021: 10(12): 1295-1297
© 2021 TPI
www.thepharmajournal.com
Received: 02-10-2021
Accepted: 11-11-2021

Abhishek Singh
Ph.D., Student, Department of Agriculture Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. Pratibha Singh
Professor and Head Department of Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. Ramesh Pratap
Assistant Professor, Department of Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. NA Khan
Associate Professor, Department of Biotechnology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Abhishek Singh
Ph.D., Student, Department of Agriculture Biochemistry, ANDUAT, Kumarganj,

To determine Aloin A & B content in *Aloe vera* (*Aloe barbadensis* Miller) leaf gels

Abhishek Singh, Dr. Pratibha Singh, Dr. Ramesh Pratap Singh and Dr. NA Khan

Abstract
The present investigation was conducted at Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya during the year 2018-19 and 2019-20. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect. The experiment revealed that Aloin A maximum in IC-112532 (0.87 ppm) and minimum in IC-112512 (0.80 ppm) and Aloin B maximum in IC- 112512 (1.27 ppm) and minimum in IC-283610 (1.17 ppm).

Keywords: Aloin, *Barbadensis*, anthraquinones

Introduction
Aloe vera is a cactus-like plant that grows in hot, arid climates and is currently grown in large quantities due to strong demand. It is regarded as an all-purpose herbal plant with a high rating throughout recorded history. The thick, tapering, spiky leaves of aloe grow from a short stem near the ground. It's not a cactus, but rather a Liliaceae tree called *Aloe Barbadensis* (Ghazanfar, 1994) [1]. Among the 75 potentially active constituents in *Aloe vera* are vitamins, enzymes, minerals, carbohydrates, lignin, saponins, salicylic acids, and amino acids (Richard, 2005) [8]. The vascular layer of *Aloe vera* plants contains two major liquid materials: first, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves and containing a high concentration of anthraquinone compounds; and second, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves within the vascular layer and containing a high concentration of anthraquinone compounds, which has been used throughout the centuries as a cathartic and for medicinal purges; and, second, the inner central zone's thin-walled tubular cells form a translucent mucilaginous gel (parenchyma) that has been used since past to treat burns and other wounds, where it's thought to extend the speed of healing and reduce the risk of infection (Joseph & Raj, 2010) [6]. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect (IARC, 2016) [4]. Except within the pharmaceutical industries, the aloe plant was first used commercially in the manufacturing of "aloin", a latex substance (a yellow sap). In the food industry, it's the potential to be used as a food preservative (substitute of sulphur dioxide in preserving fruit and vegetables). Because of its anti-oxidant characteristics, it's becoming more popular as a natural covering. The leaf powder is employed during a number of ayurvedic medicines because it contains antioxidants, dietary fibre, iron, etc. Many researchers have tried to figure out what active ingredients are present in *Aloe vera* gel (Habeeb *et al.*, 2007) [2]. Proteins, lipids, amino acids, vitamins, enzymes, inorganic substances, and various carbohydrates are contained in polysaccharides located within the inner leaf parenchymatous tissue or pulp, (Hamman *et al.*, 2008) [3]. When the leaves are removed from the basal portion of the mother plant, the sap starts draining out immediately products made from *Aloe vera* plants such as gel, aloin, etc. (Pandey *et al.*, 2016) [7].

Materials and Methods
Aloin A & B content was estimated by the method of thin layer chromatography (TLC) is given by Izmailov and Shraiber (1938) [5].

Crystallization/drying
To carry out thin layer chromatography pre coated silica gel plates spectrophotometer is used

The Pharma Innovation Journal 2021; 10(2): 706-709

www.ThePharmaJournal.com

The Pharma Innovation

NAAS Rating: 5.03
TPI 2021; 10(2): 706-709
© 2021 TPI
www.thepharmajournal.com
Received: 08-11-2020
Accepted: 12-02-2021

Surya Bala Yadav
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

RP Singh
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Pratibha Singh
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

PK Shukla
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Corresponding Author
Surya Bala Yadav
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Nutritional Evaluation of Milky Mushroom *calocybe indica*) grown on different substrates

Surya Bala Yadav, RP Singh, PK Shukla and RN Kewat

Abstract
Milky mushroom (*Calocybe indica*) is a potential new species to-the world mushroom growers. This species is suitable for hot humid Climate and can be cultivated indoor at high temperature and high humid areas. Milky mushroom is gaining popularity among the edible mushroom because of its white attractive robust sporocaps highest ptotein content long self life and taste. This variety of mushroom can be cultivated easily at home without much expenditure. The different substrates were tested along and in combination with spent wheat straw (SWS) to determine the effect of substrates nutritional level on the nutritive value of fruiting bodies produced. Mushroom have attracted to attention of human from very ancient times and the use of mushroom is an old as human civilization. Mature fruit bodies are C. Indica contains high protein content (19.72%) it has 12 amino acids. Out of all amino acids glycine is predomiment and the essential acids like tryptophan, methionine and Lysine conteut in dry weight baris are 0.92, 0.93 and 7.86 (mg/ 100g protein).

Keywords: Milky mushroom, Protein essential Amino acids

1. Introduction
Milky mushroom is a alternative source of a protein for a predominantly vegetarian population of this country has to concentrate on a vegetable protein. Mushroom has been recognized by FAO as food contributing to the protein nutrition the countries depending largely on cereals. The quality of mushroom protein is for superior to the vegetable and is a good as a just inferior to animal protein. It is because all the essential amino acids are present is mushroom most abundant amino acid is lysine. Mushroom are rich in lysine and tryptophan can effective by supplement the cereals in terms of protein quality gain in body weight of mice fed on mycelia of P sajor-caju and P. Ostreatus has been reported other indices of protein quality like chemical score. Essential amino acids, biological value protein score and nutritional value index also been employed in mushroom.

Mushrooms are good source of many vitamins specially those of B complex group but are relatively poor in fat soluble vitamin A, D, E and K. Amongst B Complex vitamin mushrooms are specially rich in thiamine (B) riboflavin (B2), niacin and biotin folic acid and vitamin B12, which are generally absent in plant feeds are present in mushroom though a small quantities. As little as 3 grams of fresh mushrooms may provide the recomended daily intabe of vitamin B12.

As a few calories high protein diet with almost no starch and sugars, mushrooms are the delight of diabeties due to high K: Na ratio. Few calories and low fat (rich in linoleic acid and lacking cholesterol). Mushroom are the choice of the dietician for those suffering with obesty hypertension and atherosclerosis (heart disease). Alkaline ash and high fibre content make them suitable for those suffering from hyperacidity.

Materials and method
The present experiment were carried out in mushroom cultivation rooms and research laboratory of the Department of plant Patnology and Biochemistry, N.D. University of Agriculture and Technology Kumarganj, Faizabad during 2006-2007 and 2007-2008. The treatment comparise 10 level of straw in which 1-5 levels are pure different Straw are 6-10 levels are Different pure straw with SWS (spent wheat straw).

Protein content-
The content of protein in dried fruiting bodies was determined by lowry's (1951) method depending on the quantitating colour obtained from the reaction of protein with folin's reagent.

The Pharma Innovation Journal 2022; 11(7): 2037-2048

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(7): 2037-2048
© 2022 TPI
www.thepharmajournal.com
Received: 14-05-2022
Accepted: 23-06-2022

Narendra Pratap Verma
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Associate Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shambhoo Prasad
Associate Professor, Department of PMB & GE, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pratibha Singh
Professor, Department of Agril. Biochemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Assistant Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pradip Kumar Saini
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Narendra Pratap Verma
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Identification and evaluation of rice (*Oryza sativa* L.) genotypes for drought and salinity tolerance: Growth and yield approach

Narendra Pratap Verma, RK Yadav, AK Singh, Shambhoo Prasad, Pratibha Singh, Alok Kumar Singh and Pradip Kumar Saini

Abstract
The investigation entitled Identification and evaluation of rice (*Oryza sativa* L.) genotypes for drought and salinity tolerance: growth and yield approach" was conducted during *Kharif* season, 2020-21 and 2021-22 at the field of Student's Instruction Farm, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya-224 229 (Uttar Pradesh). In same manner 72 rice genotypes/varieties were grown for phenotype screening for Salinity in Augumented Block Design in saline soil with four checks (two resistant check Narendra Usar Dhan 3 and CSR -10, two susceptible check Barani Deep and Jaya) and growth and yield parameters data were recorded. *i.e.,* Plant height at 65, 80 DAT (cm), Plant height at maturity (cm), Tiller number plant^{-1} (count), Flag leaf area (cm^2), Fresh weight plant^{-1} (g), Dry weight plant^{-1} (g), Panicle length (cm), Numbers of grains panicle^{-1} (count), Test weight (g), Grain Yield plant^{-1} (g). Reduction in growth parameters like, plant height, tiller number shoot fresh weight and dry weight was noted in all 40 genotypes under low moisture stress as well as in salinity stress. Drought tolerant variety Nagina-22 show minimal reduction in above said character under low moisture stress. While drought susceptible variety IR-64 show maximum reduction in these character under low moisture stress. In salinity stress salt tolerant variety CSR-10 & Narendra Usar -3 show less reduction with respect to susceptible varieties Jaya which show maximum reduction under salinity condition and Yield component like, Panicle length, total number of grains, test weight, and yield per plant of all verities decreased under both low moisture stress and salinity stress. However under drought condition, maximum reduction was noticed in IR-64 followed by Jaya while lowest reduction was seen in Nagina-22 followed by DRR-44, DRR-42 Sukha Dhan-5 & Sushk Samrat. In case of salinity stress minimum reduction in yield attributing traits was seen in tolerant varieties CSR-10, Narendra Usar-3, CSR-36, CSR-43 & Narendra Usar-2 while maximum reduction was found in susceptible varieties, Barani Deep, Jaya & IR-64.

Keywords: Rice, drought, salinity, growth and yield

Introduction
Rice (*Oryza sativa* L.) is a plant of Asian origin, belonging to the family of Graminae (Poaceae). Rice is the most widely cultivated food crop in the world and plays a very important role in providing essential nutrients to a large segment (approximately 90% of the Asian population) of the world's population as it is the staple food of more than half of the world's population and is considered as the backbone of food security in India, China, and other Southeast Asian countries (USDA 2020-21). Rice is cultivated on an area of 164.19 mha in the world with an annual production of 650.19 million tons (509.87 million tons of mild rice) Statista, 2022) and more than 142 mha in Asia. Rice occupies 43% of total food grain production and 46% of total cereal production. India ranks second among the top rice producers in the world after China. Within the country, rice occupies 1/3 of the total cropped area, contributes about 40 to 43% of total food grain production, and continues to play a key role in the national food and livelihood security system (Annual report 2021-2022 Dept. of agriculture & farmer welfare MA&FW India). India ranked first in the area having 45.07 million hectares and second in production 122.27 million tonnes. The productivity of rice in India is 2713 kg per hectare. The area and production of rice in the U.P. are 5.68 mha & 15.66 million tonnes per hectare respectively. Which is 12.60% of the total area in India & 12.81% of total production in India. The productivity of rice in UP is 2759 kg per hectare. UP has ranked first in the area and second in production (Agriculture statistics at a glance, 2021).

6.00 NAAS Rating

Legume Research, 41(2) 2018 : 263-266
Print ISSN:0250-5371 / Online ISSN:0976-0571

AGRICULTURAL RESEARCH COMMUNICATION CENTRE
www.arccjournals.com/www.legumeresearch.in

Biochemical and physiological studies on Rhizobium inoculated chickpea (*Cicer arietinum* L.) cultivar grown in eastern Uttar Pradesh

Harendra Singh, Mritunjay Tripathi*, Pratibha Singh and Rajan Pratap Singh

Department of Biochemistry, N.D. University of Agriculture and Technology, Kumarganj, Faizabad-224 229, Uttar Pradesh, India.

Received: 29-04-2016 Accepted: 23-03-2017 DOI: 10.18805/lr.v0iOF.9103

ABSTRACT

Health promoting biochemical parameters of fifteen distinct chickpea cultivar (Desi and Kabuli) showed wide variability in their biochemical and physiological composition, malic acid content, days to 50% flowering, primary branches per plant, number of pods per plant. Malic acid content polled mean ranged from 0.40 to 0.49 % in control, *rhizobium* inoculated 0.46 to 0.54% and 0.42 to 0.50% in control, *rhizobium* inoculated 0.49 to 0.54 % at 45 DAS and 90 DAS respectively, pooled mean primary branches per plant in different genotypes ranged from 4.45 to 5.70 in control and 4.90 to 6.45 in *rhizobium* inoculated chickpea genotypes, days to 50% flowering in chickpea ranged from 75.00-87.00 days in control, *rhizobium* inoculated 75.00-86.00 days, number of pods per plant in chickpea ranged from 21.98-62.91 in control, *rhizobium* inoculated 26.85-73.02. The research result about the biochemical characteristics of control and rhizobium inoculated chickpea genotypes are expected to provide guidelines for the researches confronted with the need to use such typical food seed in India as well as in the rest of the world.

Key words: Cultivar, Days to 50% flowering, Malic acid content, Number of pods per plant, Primary branches per plant.

INTRODUCTION

Chickpea is ancient cultivated crop of South Asia, the middle East and the South Africa that has grown for many years in these regions (Shah *et al*., 2012). It is a rich source of proteins and provides best food of vegetarians (Yadav *et al* .,2007). It contain about 16-31.2 % proteins and 38.1-73.3 % carbohydrates (Schirali,1988). Like other grain legumes, chickpea is a good source of mineral and vitamins. Consumption of whole seed of chickpea is desirable science its seed coat contribute about 70 % of the total seed calcium (Williams and Singh,1987).

The leaves of chickpea secretes malic acid but the significance of this secretion is not known. The PEP carboxylase activity and the secretion of malic acid are associated with the presence of glands on the surface of leaves and fruit. PEP activity increase while malic acid secretion and malic dehydrogenase activity decrease in water stress plants. However, the significant malic acid secretion in chickpea should be consider in relation to the insect pest of the plant (Koundal and Sinha, 1983).

Different chickpea varieties showed genetic variability for plant height, number of primary branches, number of secondary branches, number of pods per plant and total biological yield (Qureshi *et al*, 2004).

Besides, this medicinal importance can not over looked as scurvy patients are advised by the doctor to take germinated gram seed to get rid-off. Malic and oxalic acid collected from green, leaves of gram are prescribed for intestinal disorders (Wealth of India 1950). Germinated seeds are recommended as a prophylactic agent against deficiency, diseases. Keeping in view of above utmost importance of chickpea pertaining to human health, diversified use and insufficient inferences of the present investigation was undertaken.

MATERIALS AND METHODS

The present investigation on "Biochemical and Physiological studies on Rhizobium inoculated chickpea (*Cicer arietinum* L.) cultivar grown in eastern U.P." was carried out at Student's Instructional Farm and in the laboratory of Department of Biochemistry during *rabi* season of 2010-11 and 2011-12. After harvesting the seeds were collected and stored in desiccators for the analysis of various biochemical parameters.

Malic acid content was determined by the method described in A.O.A.C. (1970). The total number of primary branches per plant on five plants randomly selected from each line was counted and averaged out at the line of maturity. Days to 50 % flowering was recorded as the number of days from sowing to the date on which 50 percent plants of each plot flowered. Total number of seeds bearing mature pods were counted separately from sampled five plants in each row and averaged out for single plant.

*Corresponding author's e-mail: mritunjay.biochem@gmail.com

The Pharma Innovation Journal 2021; 10(2): 701-705

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2021; 10(2): 701-705
© 2021 TPI
www.thepharmajournal.com
Received: 05-11-2020
Accepted: 08-12-2020

Surya Bala Yadav
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

RP Singh
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Pratibha Singh
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

PK Shukla
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Corresponding Author:
Surya Bala Yadav
Department of Biochemistry
Narendra Deva University of Agriculture & Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Effect of different substrates on the growth and yield of milky mushroom (*Calocybe indica* P & C)

Surya Bala Yadav, RP Singh, Pratibha Singh and PK Shukla

Abstract
Milky mushroom (*Calocybe indica*) is one of the most potential species of mushroom, being cultivated in tropical and subtropical parts of India. It's high productivity, beautiful shape and colour, pleasant flavour and good shelf life are the major characters responsible to establish it among the mushroom growers and consumer. At present it is mostly being cultivated on wheat straw, however, like other mushroom, it can also be grown on other substrates. Keeping in view the economic of production different substrates were tested along and in combination with spent straw (SWS). Observation on time of taken for spawn run indicated that there was not much difference among the substrates; it look 20-30 days. Extent of spawn run varied greatly among the substances and it was highest in wheat straw (WS, 98.38) followed by sugarcane bagasse (Scb, 97.75), Scb + SWS 96.75, paddy straw (Pds, 95.5), PdS + SWS 94.5, WS + SWS 92.5, mustard straw + SWS (MS + SWS 73.75, MS 15.5, pigeonpea straw + SWS (PgS + SWS 10.0), and PgS 4.8 respectively. No difference was observed in time taken for pinhead initiation after casing. Effect of different substrates on length, average weight and number of fruiting bodies was mostly observed significantly. Highest yield of fruiting bodies was recorded in wheat straw followed by Scb, Scb + SWS, PdS, PdS + SWS, WS + SWS, MS + SWS, MS, PgS, SWS and PgS respectively. All the substrates were found productive upto varying degree of extent except pigeonpea straw. Usefulness of SWS was also proving in combination with different substrates.

Keywords: Substrates, *Calocybe indica*, pigeonpea, Milky mushroom

1. Introduction
Milky mushroom is commonly known as dudhiya mushroom. It is recommended as most suitable diet for diabetic patients. It is a important and used as vegetable in Indian food. Mushroom having various shape, size and colours. All quite different in character, appearance, edibility. Commonly a consist is cap or piles and stalk or stipe but other may have additional structures like annules and valva performing various functions in the life cycle of the fungus. This mushroom naturally grown on the humas rich soil under trees and in agriculture field in local language it is called "Kundu" or more popularly Dhudhi "Chhata". During rainy wind form of *C. indica* were observed near Calcutta and their edibility was confirmed. Natural occurrence of plains of Tamil Nadu, Rajasthan and U.P. The nutritive value of milky mushroom in comparable with other mushroom. Due to its alkaline and higher fibre content, it is highly suitable for people with hyper acidity and constipation protein content in *C. indica* has been documented to range between 17.7-28.5 per cent, fat 4.1 per cent, crude fibre 2.3-3.4 per cent and carbohydrate 50.0-64.0 per cent.

According to an estimate (Chang, 2002), total world production of mushroom was 12 million tones and it is being increased annually more than 12 per cent during 1981 to 1997. Highest production is done in China while U.S. is the biggest consumer of mushrooms. World production of cultivated mushroom in 1981 was 1257.2 thousand mt, in 1986, 2176.0 thousand mt, in 1990, 3794 thousand mt, in 1994, 4909.3 thousand mt, in 1997, 6158.4 thousand mt (Singh and Mishra, 2006) [16].

First attempt on the induction of fruiting bodies of *Calocybe indica* P & C in culture by (Purkayastha, 1979) [11] was made almost three decades ago. However, only limited success was achieved on its cultivation and exploitation till 1990 (Chakraverty *et al.*, 1981; Doshi *et al.*, 1989; Purkayastha and Nayak, 1981) [2, 6, 12]. Later, owing to efforts made under all India Coordinated Mushroom Improvement Project (AICMIP), it is now being cultivated on commercial scale during summer throughout the country.

Cultivation of *C. indica* is mainly done on substrates like wheat, paddy straw, sugarcane wastes, etc. Spawning is done with spawn @ of 4% of wet weight of straw containing about

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

QUALITY PARAMETERS OF TOMATO (*LYCOPERSICON ESCULENTUM* MILL.) STRAINS / VARIETIES AT RIPENING STAGE GROWN IN EASTERN U. P.

Brijesh Kumar*, Pratibha Singh, R. N. Kewat, R. K. Yadav and S. K. Vishwakarma
Department of Agril. Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya- 224 229 (U.P.) India

Abstract

Ten germplasms of tomato namely NDTH-90, NDTH-101, NDTH-108, Kalyanpur Selection-2, Kalyanpur Selection-3, Kalyanpur Selection-6, IIVR Selection-2, CO-3, Arka vikas and Pusa Early Dwarf were analysed at ripening stage.

The data obtained in the experiment showed the highest fruit size length and diameter (4.83, 7.17 cm) at ripening stage was found in variety Pusa Early Dwarf & Arka vikas. Maximum fruit weight (95.33g.) and specific gravity (1.28 ml/cc) at ripening stage in variety CO-3 & Pusa Early Dwarf .Whereas maximum ascorbic acid (27.67 mg/100) at ripening stage was found in variety NDTH-101 and total mineral (0.80 mg/100g) at ripening stage was found in variety Arka vikas. Total acidity (0.50 %) at ripening stage was found in variety Pusa Early Dwarf. Maximum lycopene (4.93 mg/100g) at ripening stage was found in germplasms Kalyanpur Selection-6 and β carotene (1.50 mg/100g) at ripening stage was found maximum in germplasms Kalyanpur Selection-3. Whereas, total chlorophyll (1.77 mg/100g)at ripening stage was found maximum in germplasms NDTH-90 chlorophyll a & b (1.27, 0.58 mg/100g) at ripening stage was found maximum in variety/germplasms NDTH-108 & Pusa Early Dwarf .Whereas Polyphenol oxidase (35.87 unit/mg) and Peroxidase enzyme (1.80 unit/mg) were found maximum in variety /germplasms Arka vikas & NDTH-108. have highest total sugar (6.40 %) and non-reducing sugar (1.80 %) at ripening stage was found maximum in variety CO-3, T.S.S. content (4.83 %) at ripening stage was found highest in germplasms NDTH-101 and reducing sugar (4.77 %) was found maximum in germplasms Kalyanpur Selection-6, Total free amino acid (12.73 mg/100g) as found maximum in germplasms Kalyanpur Selection-6. Maximum lycopene (4.93 mg/100g) at ripening stage was found in germplasms Kalyanpur Selection-6.

Key words:- Fruit size, weight, specific gravity, colour, lycopene, β carotene, chlorophyll a and b , ascorbic acid, total mineral, titrable acidity, Polyphenol oxidase, Peroxidase. T.S.S., total sugar, non-reducing sugar, reducing sugar, lycopene and total free amino acid.

Introduction

The tomato (Lycopersicon esculentum Mill.) is one of the most widely consumed and most popular fresh vegetable in the industrialized world. Tomato belongs to the family Solanaceae having diploid chromosome number (2n=24). It is the world's largest vegetable crop after potato and sweet potato but it tops the list of canned vegetables. It is an important condiment in most diets and a very cheap source of vitamins and antioxidents. It also contains a large quantity of water and calcium and Niacin which are of great importance in the metabolic activities. Tomato is a good source of vitamins A, C, E and minerals that are very good for body and protect the body against diseases (Taylor, 1987).

Tomato is the second most widely grown vegetable crop in the world other than potato **(Hanson et al., 2001)**. Canada is the second larger producer of tomato next to Mexico. Total area of world under tomato cultivation is 4.50 million ha and total production is 240.51 million tonnes with 31.8 tonnes /ha productivity whereas, in India total area is 0.767 million ha and production is 16.385 million tonnes with 21.353 million tonnes /ha productivity. In U.P., total area is 0.010 million ha, production is 0.413 million tonnes with 39.488 million tonnes /ha productivity. **(NHB, 2014-15)**. Tomato crop is adapted to a wide variety of climates ranging from the tropics to within a few degrees of the Arctic Circle. However, in spite of its broad adaptation, production is concentrated in few warm and rather dry areas. Though, it is a perennial plant in tropical climates, it is grown as an annual in North America. Tomatoes find numerous uses in both fresh and processed forms that include ketchup, sauces, pastes and juice. Tomato is considered as an important cash generating crop for small holders and medium scale commercial farmers providing employment opportunity in the production and processing industries **(Naikaet al., 2005)**.

Tomatoes commonly consumed in daily diets are a major source of antioxidants. Tomatoes being an important source of potassium, phosphorus, magnesium, iron, so necessary to the normal activity of nerves and muscles. Vitamins as A, B and C tomatoes is the third source of vitamin C in our diet and the fourth for vitamin A, through its content in beta-carotene or pro vitamin A. Phytosterols, compounds that help to keep cholesterol under control folic acid, which helps eliminate homocysteine, an amino acid whose metabolism is dependent on the metabolism of vitamins from B complex, especially that of folic acid. Compositionally, the tomato has a unique nutritional and phyto-chemical profile. The major phyto-chemicals in tomato are the carotenoids consisting of 60 to 64% lycopene, 10 to 12% phytene, 7 to 9% neurosporene, and 10 to 15% carotenes. Tomatoes based foods are the world rich sources of lycopene (Sgherri et al., 2008). Based on a fresh weight basis, tomato (on average) contains about 35 mg/kg of lycopene, with red cultivars containing in average 90 mg/kg of lycopene and yellow ones only 5 mg/kg Processed tomatoes (sauce, paste, juice, and ketchup) contain 2- to 40-fold higher lycopene than fresh tomatoes.

Materials and Methods

The experiment was conducted in the department of vegetable science at MES of vegetable farm, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P) during the Rabi season 2016-2017. The climate of Ayodhya comes under the category of semi-arid.

The fruit size has been taken by varnier callipors and specific gravity by water displacement methods. Total chlorophyll, total free amino acid and chlorophyll a and d were analysed by Jayraman (1981). TSS and acidity have been done by Rangana (1986) Reducing sugar have been analysed by Miller (1959) and Total sugar by the Dubois,et.al method. Lycopene have been done by Adsule etal.1979 and β carotene by Collumn method, 1953.Total mineral content have done by hort and Fischer, 1971 method and ascorbic acid by AOAC,1970 method. Polyphenol oxidase have been determined by Farkas *etal.* 1962 and Peroxidase was analysed by MaCune and Galston 1959.

Results and Discussion

The fruit length varied from 3.90-4.83 cm at ripening stage was respectively. These results are nearly corresponding with **Chattopadhyay *el al.* (2013)**. The fruit size decreases at ripening stage is attributed to the loss of moisture and carbohydrates in accordance with **Karki (2005)**. The fruit diameter varied from 4.80-7.17 cm at ripening stage. These results are nearly corresponding with **Chattopadhyay *el al.* (2013)**. The fruit size decreases at ripening stage is attributed to the loss of moisture and carbohydrates in accordance with **Karki (2005)**.

In the present investigation, average fruit weight of tomato varieties / strains at ripening stage was ranged from 46.97-95.33 g, the similar data was found by Leonardi *et al.* **(2000)**. The fruit weight decreases within excepted of weight loss per cent, the mean weight loss at ripening stage was varied weight loss 11.16 per cent are in accordance with **Getinet *et al.* (2008)**.

Legume Research, 41(2) 2018 : 263-266
Print ISSN:0250-5371 / Online ISSN:0976-0571

AGRICULTURAL RESEARCH COMMUNICATION CENTRE
www.arccjournals.com/www.legumeresearch.in

Biochemical and physiological studies on Rhizobium inoculated chickpea (*Cicer arietinum* L.) cultivar grown in eastern Uttar Pradesh

Harendra Singh, Mritunjay Tripathi*, Pratibha Singh and Rajan Pratap Singh

Department of Biochemistry, N.D. University of Agriculture and Technology. Kumarganj, Faizabad-224 229, Uttar Pradesh, India.

Received: 29-04-2016 Accepted: 23-03-2017 DOI: 10.18805/lr.v0iOF.9103

ABSTRACT

Health promoting biochemical parameters of fifteen distinct chickpea cultivar (Desi and Kabuli) showed wide variability in their biochemical and physiological composition, malic acid content, days to 50% flowering, primary branches per plant, number of pods per plant. Mulic acid content polled mean ranged from 0.40 to 0.49 % in control, *rhizobium* inoculated 0.46 to 0.54% and 0.42 to 0.50% in control, *rhizobium* inoculated 0.49 to 0.54 % at 45 DAS and 90 DAS respectively, pooled mean primary branches per plant in different genotypes ranged from 4.45 to 5.70 in control and 4.90 to 6.45 in *rhizobium* inoculated chickpea genotypes, days to 50% flowering in chickpea ranged from 75.00-87.00 days in control, *rhizobium* inoculated 75.00-86.00 days, number of pods per plant in chickpea ranged from 21.98-62.91 in control, *rhizobium* inoculated 26.85-73.02. The research result about the biochemical characteristics of control and rhizobium inoculated chickpea genotypes are expected to provide guidelines for the researches confronted with the need to use such typical food seed in India as well as in the rest of the world.

Key words: Cultivar, Days to 50% flowering, Malic acid content, Number of pods per plant, Primary branches per plant.

INTRODUCTION

Chickpea is ancient cultivated crop of South Asia, the middle East and the South Africa that has grown for many years in these regions (Shah *et al*., 2012). It is a rich source of proteins and provides best food of vegetarians (Yadav *et al* .,2007). It contain about 16-31.2 % proteins and 38.1-73.3 % carbohydrates (Sehirali.1988). Like other grain legumes, chickpea is a good source of mineral and vitamins. Consumption of whole seed of chickpea is desirable science its seed coat contribute about 70 % of the total seed calcium (Williams and Singh,1987).

The leaves of chickpea secretes malic acid but the significance of this secretion is not known. The PEP carboxylase activity and the secretion of malic acid are associated with the presence of glands on the surface of leaves and fruit. PEP activity increase while malic acid secretion and malic dehydrogenase activity decrease in water stress plants. However, the significant malic acid secretion in chickpea should be consider in relation to the insect pest of the plant (Koundal and Sinha, 1983).

Different chickpea varieties showed genetic variability for plant height, number of primary branches, number of secondary branches, number of pods per plant and total biological yield (Qureshi *et al*, 2004).

Besides, this medicinal importance can not over looked as scurvy patients are advised by the doctor to take germinated gram seed to get rid-off. Malic and oxalic acid collected from green, leaves of gram are prescribed for intestinal disorders (Wealth of India 1950). Germinated seeds are recommended as a prophylactic agent against deficiency. diseases. Keeping in view of above utmost importance of chickpea pertaining to human health, diversified use and insufficient inferences of the present investigation was undertaken.

MATERIALS AND METHODS

The present investigation on "Biochemical and Physiological studies on Rhizobium inoculated chickpea (*Cicer arietinum* L.) cultivar grown in eastern U.P." was carried out at Student's Instructional Farm and in the laboratory of Department of Biochemistry during *rabi* season of 2010-11 and 2011-12. After harvesting the seeds were collected and stored in desiccators for the analysis of various biochemical parameters.

Malic acid content was determined by the method described in A.O.A.C. (1970). The total number of primary branches per plant on five plants randomly selected from each line was counted and averaged out at the line of maturity. Days to 50 % flowering was recorded as the number of days from sowing to the date on which 50 percent plants of each plot flowered. Total number of seeds bearing mature pods were counted separately from sampled five plants in each row and averaged out for single plant.

*Corresponding author's e-mail mritunjay.biochem@gmail.com

International Journal of Chemical Studies 2018; 6(3): 420-423

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(3): 420-423
© 2018 IJCS
Received: 11-03-2018
Accepted: 12-04-2018

Anil Kumar
Department of Biochemistry
ND University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pratibha Singh
Department of Biochemistry
ND University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Anil Kumar
Department of Biochemistry
ND University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Biochemical and antioxidative characters of underutilized fruits (Aonla, Bael, Ber, Jackfruit and Kaitha)

Anil Kumar and Pratibha Singh

Abstract
Biochemical and antioxidative evaluation of five underutilized fruit germplasms/varieties i.e Aonla (NA_6 and NA_7), Bael (NB_5 and NB_9), Ber (Karaka and Umran), Jackfruit (NJ_2 and NJ_3) and Kaitha (K_1 and K_2) resulted a slight variation within two varieties of each fruit containing to total soluble solid (TSS), malic acid, total phenols and ascorbic acid. Antioxidative characters were found higher in fresh fruit as compared to storage. On whole germplasms/varieties i.e Aonla (NA_6 and NA_7), Bael (NB_5 and NB_9), Ber (Karaka and Umran), Jackfruit (NJ_2 and NJ_3) and Kaitha (K_1 and K_2) were found best in terms of qualitative as well as biochemical and antioxidative evaluation.

Keywords: Underutilized fruits, TSS, malic acid, total phenols, and ascorbic acid

Introduction
Southeast Asia is represented by more than 500 species of fruits, while the Indian region of diversity represents 344 species of fruits having vast potential for new crops (Arora, 1995). Despite the vast biochemical and genetic diversity of these fruits, only important fruits like mango, banana, citrus and guava have gained in the productivity and acceptability by the people. Many of the indigenous tropical and temperate fruits have still remained underexploited due to the lack of awareness of their potential, market demand and low and erratic bearing in many cases. In view of the great importance of these underutilized fruit species and urgent need to strengthen the biochemical, genetic resources and improvement work.

India is the second largest producer of fruits in the world nearly covers 6.36 million hectares of area with a total production of over 88.82 million metric tonnes with productivity of 13.97 tonnes/ha. In Uttar Pradesh it is grown on 0.46 million hectares with production of 8.54 million metric tonnes, under fruit crops ranks first in terms of area, but production-wise it ranks third (Horticultural Statistics at a Glance, 2015-16) [13].

There are several fruits taken by human as its nutritional importance but several fruits are present in nature which are also nutritionally important and superior in quality but are rarely used by human because people are not aware of its nutritional importance, these fruits are known as minor fruits *viz.*, Ber, Bael, Aonla, Kaitha, Jackfruit, Karonda, Imli etc.

Gorh is a ber variety was superior in terms of ascorbic acid (176.45 mg/100g), protein (3.13%) and TSS (24.01%) (Abbas *et al.* 2012) [2]. Fresh aonla fruits of cv. Chakaiya had moisture, TSS, total sugars, reducing sugars, acidity, ascorbic acid, pectin, tannin, crude fibre, pH and browning were recorded as 86.50 per cent, 10.10 per cent, 8.53 per cent, 5.14 per cent, 1.85 per cent, 662 mg/100 g, 1.93 per cent, 2.93 per cent, 3.07 per cent, 2.90 and 0.063, respectively (Daisy and Singh 2007). Biochemical analysis of wood apple (Kaitha) revealed that the total soluble solids ranged from 12.45 to 14.67^0 Brix, ascorbic acid from 4.87 to 6.26 mg (per 100 g), reducing from 2.70 to 3.11%, non-reducing sugar from 4.90 to 6.79% and total sugar from 7.60 to 9.74% (Pandey *et al.*2013) [18]. Biochemical constituents of bael fruits such as total soluble solids, total sugars, reducing sugars and acidity percentage were analyzed to be 28.20, 16.72, 4.53 and 0.39, whereas ascorbic acid, total carotenoids, pectin and total phenols were found to be 17.21 mg/100 g, 45.33 mg/100 g, 2.40, 23.66 mg/100 g, respectively (Punam *et al.* 2009) [21]. Jagadeesh *et al.* (2010) [14] reported the biochemical parameters starch content (67.30%), TSS: Acid ratio (34.69%) and titratable acidity (31.76%) exhibited a wide variation of jackfruit clones for crop improvement.

International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 3, 2022, pp.-11199-11201.
Available online at https://bioinfopublication.org/pages/jouarchive.php?id=BPJ0000217

Research Article

DEVELOPMENT OF LOW-FAT FIBRE ENRICHED PANEER (COTTAGE CHEESE) FROM DOUBLE TONED MILK

PUJA[1], SADHNA SINGH[1*], PRATIBHA SINGH[2], RUMA DEVI[3] AND RIMA KUMARI[4]

[1]Department of Food Science and Nutrition, College of Community Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, 224229, India
[2]Department of Biochemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, 224229, Ayodhya, Uttar Pradesh, India
[3]Department of Livestock Products Technology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, 224229, Ayodhya, Uttar Pradesh, India
[4]Department of Botany, Purnea University, Purnia, 854301, Bihar, India
*Corresponding Author: Email - dolmanduat@gmail.com

Received: February 15, 2022; Revised: March 25, 2022; Accepted: March 27, 2022; Published: March 30, 2022

Abstract: The present study was conducted to develop low fat fibre enriched paneer suitable to meet the requirement of people suffering from obesity, heart diseases, hypertension and diabetes. Double toned milk was successfully utilized for preparation of lowfat paneer with acceptable sensory attributes like appearance, colour, flavor, texture and overall acceptability. Four coagulants namely allum, citric acid, curd and lemon at a minimum level of 0.6, 0.2, 22.0 and 3 percent, respectively were needed for coagulation of milk. Standardization of pressure for preparation of lowfat paneer from double toned milk resulted in a paneer with optimum moisture and highest paneer yield when pressure equal to the weight of whey was applied.

Keywords: *Double toned milk, Paneer, Yield*

Citation: Puja, *et al.*, (2022) Development of Low-fat Fibre Enriched Paneer (Cottage Cheese) from Double Toned Milk. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 3, pp.- 11199-11201.

Copyright: Copyright©2022 Puja, *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Divyanshu Gupta

Introduction

Paneer is Heat-acid Coagulated and an important indigenous milk product, which is extensively used as base material or filler in preparation of large number of culinary dishes. According to PFA act "Paneer means the product obtained from cow or buffalo milk or combination thereof by precipitation with sour milk, lactic acid or citric acid". Marble white color, mildly acidic taste, nutty flavor, spongy closely knit body and smooth texture are characteristics of a good quality paneer. Paneer is a South Asian variety of non-fermentative, non-renneted, non-melting and unripened type of soft cheese obtained by acid and heat coagulation of milk. Paneer is highly nutritious and wholesome food as it contains high amount of milk fat, protein, minerals along with moderate number of vitamins and other minor nutrients. Paneer is considered to be a rich source of animal protein for the vegetarian people, having a high biological value ranging between 80.38 and 86.56 [1]. For the preparation of this type of paneer, generally buffalo milk having a fat to SNF ratio of 1:1.65 is preferred. Because of its high fat content health-conscious people generally do not like to consume conventional paneer.

With increasing demand for paneer, advancement in the development of paneer is very important. Various advanced techniques can be applied in this venture but main problem with application of such techniques is consumer awareness regarding changes in textural & sensory quality of paneer. Therefore, in the present study efforts were made to development of low-fat fibre-enriched paneer because paneer contains high amounts of fat and no fibre.

Material and Methods

The study was conducted in the Department of Food Science and Nutrition, College of Community Science, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj Ayodhya. The raw milk sample was procured from the local market. Other material skimmed milk, toned milk and double toned milk required for the product preparation were procured from the local market and Ayodhya market.

Standardization of coagulants

To prepare paneer four coagulants namely allum, citric acid, curd and lemon juice were tried and it was found that citric acid @ 0.2 per cent, allum @ 0.6 per cent, lemon @ 3.0 percent and curd @ 22.0 per cent could curdle the milk.

Standardization of weight and time for paneer preparation: After coagulation of milk different pressures 500g, 450g, 365g (weigh of whey) for 20 minutes was applied on the paneer to obtain paneer with appropriate moisture content and good texture.

Result and Discussion

Standardization of coagulants

The minimum level of coagulants needed for preparation of low-fat paneer from double toned milk. Four coagulants namely allum, citric acid, curd and lemon were tried. Citric acid @ 0.2 per cent resulted in curdling of milk whereas allum, lemon and curd at the level of 0.6, 3.0, 22.0 per cent resulted in curdling of milk [Table-1].

Table-1 *Minimum level of coagulants needed for preparation of low-fat paneer (Cottage cheese) from double toned milk (Mean ±SE)*

SN	Coagulants	Minimum level of coagulants needed (%)
1	Allum	0.6
2	Citric acid	0.2
3	Curd	22.0
4	Lemon	3.0

Various coagulants at various strength have been tested for coagulation of milk. Raja, *et al.*, (2014) [2] prepared paneer using 7.0 per cent buffalo milk and 30 per cent soya milk and 1.0 per cent acetic acid as coagulants. Several coagulants namely lemon juice, citric acid, tartaric acid and lactic acid have been tested for coagulation of milk by Kumar, *et al.*, (1998) [3], Sachdeva and Singh, (1987) [4]. They also reported that citric acid was more acidic as compared to curd. The strength of coagulants affects the body and texture of paneer, according to Khan and Pal, (2011) [5].

The Pharma Innovation Journal 2022; 11(7): 2037-2048

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(7): 2037-2048
© 2022 TPI
www.thepharmajournal.com
Received: 14-05-2022
Accepted: 23-06-2022

Narendra Pratap Verma
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Associate Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shambhoo Prasad
Associate Professor, Department of PMB & GE, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pratibha Singh
Professor, Department of Agril. Biochemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Assistant Professor, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pradip Kumar Saini
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Narendra Pratap Verma
Research Scholar, Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Identification and evaluation of rice (*Oryza sativa* L.) genotypes for drought and salinity tolerance: Growth and yield approach

Narendra Pratap Verma, RK Yadav, AK Singh, Shambhoo Prasad, Pratibha Singh, Alok Kumar Singh and Pradip Kumar Saini

Abstract
The investigation entitled Identification and evaluation of rice (*Oryza sativa* L.) genotypes for drought and salinity tolerance: growth and yield approach" was conducted during *Kharif* season, 2020-21 and 2021-22 at the field of Student's Instruction Farm, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya-224 229 (Uttar Pradesh). In same manner 72 rice genotypes/varieties were grown for phenotype screening for Salinity in Augumented Block Design in saline soil with four checks (two resistant check Narendra Usar Dhan 3 and CSR -10, two susceptible check Barani Deep and Jaya) and growth and yield parameters data were recorded. *i.e.,* Plant height at 65, 80 DAT (cm), Plant height at maturity (cm), Tiller number plant^{-1} (count), Flag leaf area (cm^2), Fresh weight plant^{-1} (g), Dry weight plant^{-1} (g), Panicle length (cm), Numbers of grains panicle^{-1} (count), Test weight (g), Grain Yield plant^{-1} (g). Reduction in growth parameters like, plant height, tiller number shoot fresh weight and dry weight was noted in all 40 genotypes under low moisture stress as well as in salinity stress. Drought tolerant variety Nagina-22 show minimal reduction in above said character under low moisture stress. While drought susceptible variety IR-64 show maximum reduction in these character under low moisture stress. In salinity stress salt tolerant variety CSR-10 & Narendra Usar -3 show less reduction with respect to susceptible varieties Jaya which show maximum reduction under salinity condition and Yield component like, Panicle length, total number of grains, test weight, and yield per plant of all verities decreased under both low moisture stress and salinity stress. However under drought condition, maximum reduction was noticed in IR-64 followed by Jaya while lowest reduction was seen in Nagina-22 followed by DRR-44, DRR-42 Sukha Dhan-5 & Sushk Samrat. In case of salinity stress minimum reduction in yield attributing traits was seen in tolerant varieties CSR-10, Narendra Usar-3, CSR-36, CSR-43 & Narendra Usar-2 while maximum reduction was found in susceptible varieties, Barani Deep, Jaya & IR-64.

Keywords: Rice, drought, salinity, growth and yield

Introduction
Rice (*Oryza sativa* L.) is a plant of Asian origin, belonging to the family of Graminae (Poaceae). Rice is the most widely cultivated food crop in the world and plays a very important role in providing essential nutrients to a large segment (approximately 90% of the Asian population) of the world's population as it is the staple food of more than half of the world's population and is considered as the backbone of food security in India, China, and other Southeast Asian countries (USDA 2020-21). Rice is cultivated on an area of 164.19 mha in the world with an annual production of 650.19 million tons (509.87 million tons of mild rice) Statista, 2022) and more than 142 mha in Asia. Rice occupies 43% of total food grain production and 46% of total cereal production. India ranks second among the top rice producers in the world after China. Within the country, rice occupies 1/3 of the total cropped area, contributes about 40 to 43% of total food grain production, and continues to play a key role in the national food and livelihood security system (Annual report 2021-2022 Dept. of agriculture & farmer welfare MA&FW India). India ranked first in the area having 45.07 million hectares and second in production 122.27 million tonnes. The productivity of rice in India is 2713 kg per hectare. The area and production of rice in the U.P. are 5.68 mha & 15.66 million tonnes per hectare respectively. Which is 12.60% of the total area in India & 12.81% of total production in India. The productivity of rice in UP is 2759 kg per hectare. UP has ranked first in the area and second in production (Agriculture statistics at a glance, 2021).

Journal of Biotechnology
and Crop Science
6(8): 35-40, 2017

Controling pod borer (*Heliocoverpa armigera*) by natural toxin(s) in pigeon pea

NA Khan, Raja Husain, Anamika Kaushal, Pratibha Singh, KN Singh

Received: 09 February 2017; Revised Accepted: 13 April 2017

ABSTRACT

Among various constraints pigeon pea production, the insect pest has one of the prime importance. *Helicoverpa armigera* is one of the most divesting pests of this crop. Excessive use of chemical pesticides has resulted in environmental degradation, adverse effects on human health and other organism. For eradication of this insect, the researchers have shifted from chemical to biological control. The naturally killed larvae of *Helicoverpa* were crushed and growth was tested on LB agar plate, which got the *Helicoverpa* larvae dead due to bacterial micro-organism and growth on PDA media indicated the presence of fungi. The protein profiling of bacterial protein on (SDS-PAGE) 12%, indicated very low molecular weight of protein which was responsible for death of *Helicoverpa armigera*. The ammonium sulphate fraction of bacterial protein was applied @ 30%, 60% and 70% on live larvae. The rate of mortality was maximum in case of 70% ammonium sulphate fractionated protein.

Keywords: Ammonium Sulphate, PDA media, SDS-PAGE, Sephadex G-75

Introduction

Pigeon pea is an important pulse/grain legume and commonly known as red gram or arhar. It is the rich source of protein, iron, iodine and essential amino acids likewise methionine, lysine, tyrosine (Alykroid and Doughty 1964) and also supply vitamins-B, minerals and fats. The presence of different type of proteins and their smaller molecules including alkaloids, is flavones, polyphenols and a variety of oligosaccharides make legume seed unique in providing nutraceuticals. Asia produces 3.00 million tones grains from 3.81 million hectare area with 789 kg/ha productivity. India accounts for 78% of global output with current production of 2.45 million tones from 3.80 million hectare recording average yield of 686 kg/ha. In UP it is grown on 0.33 million hectare area producing 0.30 million tones of grain with average yield of 910 kg/ha (FAO, 2006). Among various constrains of pigeonpea production, the insect pest are of prime important. Pigeon pea is crop of intermediate plant type with long duration hence serves as an ideal host for many insect pests. Disease and insect pest are estimated to cause yield losses from 470 to 988 kg ha^{-1} (FAO STAT, 2008). More than 200 insect species have been reported infesting this crop. Major pest of pigeon pea are pod fly and pod borer. In India 3 species of *Helicoverpa* are found viz. *H. armigera*, *Helicoverpa assulta* and *H. peltigera* .The larvae of *H. armigera* destroys the buds, flowers and pods. It bores inside the pod of pigeon pea during vegetative state and damages inside the pod. In the absence of pod larvae feeds on foliage. The world wide annual losses caused by *H.armigera* in pigeon pea are $ 317 million (Shanower *et al;* 1999). In India yield losses of pigeon pea due to insect and disease ranged from 470 to 988 kg ha^{-1} which accounts for 29-85% of grain yield in different cultivars. The non-judicious use of chemical insecticides has led to the development of resistance to one or more multiple insecticides in over 500 species of insects (Akhurst,

NA Khan (✉), Raja Husain, Anamika Kaushal, Pratibha Singh
Department of Plant Molecular Biology & Genetic Engineering
e-mail-nakhan0110@gmail.com
K N Singh
Department of Biochemistry, NDUA&T Kumarganj, Faizabad (U.P.) 224229

NARL Lib-54

Bioved, 28(2) : 455–459, 2017 http://biovedjournal.org/

Changes in the cell wall degrading enzyme and peroxidase activities during development and ripening of guava cv. Allahabad Safeda (*Psidium guajava* L.)

Aparna Dube, Mritunjay Tripathi and Pratibha Singh

Department of Biochemistry, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad - 224 229 (U.P.), India

Received April 7, 2017 and Accepted July 9, 2017

ABSTRACT : Changes in the activities of cell wall degrading enzymes pectinmethylesterase (PME) and cellulase along with activity of antioxidant enzyme peroxidase (POD) were investigated during development and ripening stages of guava fruit cv. Allahabad Safeda. PME activity increased up to the climacteric peak of respiration, whereas cellulase showed progressive increase in activity throughout ripening. Similarly, POD activity decreased during development of the fruits and increased in the pre-ripening and ripening stages.

Key Words : Guava, enzyme changes, cellulase, peroxidase, fruit ripening

Guava (*Psidium guajava* L.) is the most important commercially grown fruit crop that occupies a crucial place in the horticultural wealth of our nation and ranks fourth with respect to area and production. In recent years, this fruit crop has gained considerable prominence on account of its high nutritive value, pleasant aroma, good flavour and availability at moderate price (Negi *et al.*, 2014). Although, our country has great potential to produce high quality guavas and to export them to other countries, its marketability is still limited to local markets due to delicate nature of the fruit, poor handling practices, and inadequate transportation and storage facilities. Ripening is the process by which fruits attain their desirable flavour, quality, colour, palatable nature and other textural properties. The most obvious feature of guava fruit ripening is softening,which reflects chemical and physical changes in cell wall. Fruit softening is associated with cell wall disassembly and modifications to the pectin fraction are some of the most apparent changes that take place in the cell wall during ripening.

Materials and Methods

Guava (*Psidium guajava* L.) fruit *cv.* Allahabad Safeda was used as experimental material which was harvested from Main Experiment Station, Horticulture Farm, NDUAT, Kumarganj during winter season. The sample was free from blemishes, any visible sign of disease, infestation and physical injury. For enzymic studies, pulp without seeds from fresh fruits was dipped in liquid nitrogen and stored in an ultra-freezer maintained at 80 ± C.

Cell Wall Degrading Enzymes

Enzyme assays

Pectinmethylesterase : Pectinmethylesterase activity (PME, EC 3.1.1.11) was assayed by the procedure of Mazumdar (2003). Enzyme was extracted from fruit pulp (5g) by homogenizing with a mixture of 10 per cent sodium chloride solution, 1 per cent EDTA and 1 per cent PVP at 4°C for 15 minutes. PVP was added to bind the phenolic compounds which inhibit enzyme activity. The homogenate was adjusted at 7.0 pH with 0.1 N NaOH solution. Then it was centrifuged (30000g) at 4°C for 10 minutes. The supernatant was used as an enzyme extract for assay of enzyme activity. The reaction mixture containing 20 ml of 1 percent pectin solution and 5 ml of 1 M NaCl were taken in a beaker. Then 10 ml of distilled water was added to it and the beaker was placed over a hot water bath at 30°C. The reaction was started by addition of 10 ml of enzyme extract with continues stirring. The pH of the reaction is adjusted to 7.5. The reaction was carried out at 30°C

Int.J.Curr.Microbiol.App.Sci (2017) *6*(11): 3572-3576

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 11 (2017) pp. 3572-3576
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.611.419

Biochemical Composition and Enzymatic Activity of *Aloe vera* (*Aloe barbadensis* L.)

Chetna Gangwar, Pratibha Singh, Raj Narayan Kewat and Nitin Vikram*

Department of Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad 224229, U. P., India

**Corresponding author*

Keywords

Anthraquinones, Cosmetic, Lignins, Salicyclic acid, Steroids and vitamins.

Article Info

Accepted: 26 September 2017
Available Online: 10 November 2017

ABSTRACT

Aloe vera has a long history as a medicinal plant with diverse therapeutic applications. This study determined biochemical composition and enzymatic activity of *Aloe vera* leaves. Five genotypes of aloe vera leaves were analysed biochemically and enzymatically. Germplasm IC-112517 showed maximum gel percentage (97.00 %), maximum moisture percentage (97.03) and IC-112527 contain maximum per cent of carbohydrate (64.20%), total mineral (11.10%) and total sugar content (30.07%) and total chlorophyll content (0.20 mg/gm). The germplasm IC-285626 showed maximum per cent of crude fibre content (11.43%). Germplasm IC- 112527 showed maximum catalase enzyme activity (1.92unit/ml) and peroxidase enzyme activity (1.67 unit/ml). Overall this investigation has provided a succinct resume of information regarding the biochemical composition and enzymatic activity of *Aloe vera* leaves. It would be worthwhile embarking on an intensive scientific experimentation and investigation on this valuable medicinal plant and to promote its large scale utilization.

Introduction

Aloe vera (*Aloe barbadensis*) is a perennial, drought resisting succulent plant belonging to the Liliaceae family with its origin in the African continent. The *Aloe vera* plant has been known and used for centuries for its health, beauty, medicinal and skin care properties (Rai *et al.*, 2011). The parenchyma cells contain a transparent mucilaginous jelly which is referred to as *Aloe vera* gel (Ramachandra and Rao, 2008). In India it is used as tonic for anemia, poor digestive function and liver disorders. *Aloe vera* is being used as an ingredient for functional food, mainly in the development of health drinks and beverages like tea, *etc.* (Singh *et al.*, 2010). *Aloe vera* is the most commercialized aloe species and processing of the leaf pulp has become a large worldwide industry. In the food industry it has been used as a source of functional foods and as an ingredient in other food products for the production of gel containing health drinks and beverages. In the cosmetic and toiletry industry, it has been used as base material for the production of powders, capsule, creams, lotions, soaps, shampoos, facial cleansers, oils and other products for both external and internal uses for a wide variety of indications (Hamman, 2008; Haque *et al.*, 2012). *Aloe* has broad range of pharmacological

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special Issue [3] 2017: 550-552
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE OPEN ACCESS

Biochemical evaluation of different Varieties /germplasm of finger millet (*Eleusine coracana L.*)

Ramanand[1] , R.N. Kewat[2], S.K.Z. Rizvi[3], Ramesh P, Singh[4], R.P. Singh[5] . and Pratibha Singh[6]
Department of Biochemistry Narendra Deva University of Agriculture & Technology, Kumarganj,Faizabad.
Email: ramanand1592@gmail.com; rnkfzd73@gmail.com; kulsoom.zehra786@gmail.com

ABSTRACT

The present investigation was carried out to study the Nutritional component in finger millet. Biochemical characteristics such as protein, Total minera! content carbohydrate content,Total sugar content and reducing sugar content were studied in present investigation in finger millet varieties. Ten germplasm such as namely VL- 175, VL-149, VL-101, VL-201, VL-204, VL-315, VL-324, VL-347, VL-124 and VL-146 were selected for present investigation and were analyzed for biochemical parameters the variation in . Protein content ranged from 7.60 – 9.20%, total mineral from 2.50 to 3.50%, total carbohydrate content from 69.70 to 74.80 %. Total sugar from 1.40 to 2.90 % and reducing sugar 0.50-0.90 % these parameters were effective for selection of better germplasm in finger millet.
Key word- Finger millet, Protein, Total mineral, carbohydrate, Total sugar and reducing sugar.

Received 28.07.2017 Revised 04.08.2017 Accepted 26.08. 2017

INTRODUCTION

Finger millet (*Eleusine coracana*) belongs to family Poaceae. Which is also known as 'ragi' in India is an important staple food for people belong to the low socio-economic group. It is the third most important minor millet in India. It is also known as African millet. . As nutritional supplement, the food products are fed to pregnant and lactating mothers, babies and the sick persons. Finger millet is primarily consumed in developing countries and it is often referred to as a "crop for the poor" or a "famine food", because of and high nutritional and medicinal properties it has proved to be a "super cereal". Rich source of phytochemicals and dietary fibre which offer several health benefits. The hyperglycemic activity of ragi millet has evidence the hypoglycemic, hypochole-sterolaemic, nephroprotective and anticataractogenic properties of finger millet, suggesting its utility as a functional ingredient in diets for diabetics. The women with signs of cardiovascular disease like high blood pressure, increased cholesterol content. It also forms an essential part of nervous system and cell membranes. The body metabolism linoleic acid into arachidonic acid and docosahexaenoic acid, respectively, which are essential to the normal development of the central nervous system (Brich *et al.* 2007).

Brown varieties contained (1.2–2.3%) higher proportions of polyphenols than white (0.3–0.5%) varieties of this minor millet.'The main polyphenols in this minor millet are phenolic acid and tannin, while flavonoids are present in small quantities. Ragi had highest phytic acid (685 mg/100g) total polyphenols 298 mg/100g, and tannins (18.75mg/100g), flavonoids (23.68 mg/100g) and trypsin inhibitors (102.6mg/100g) (Kumar *et al* 2013). Most of the Indian diet is deficient in one or two nutritional component so this millet is helpful in providing protein, vitamin and minerals. Considering the importance ragi millet the present study was conducted to estimate various nutritional content.

METHODS AND MATERIALS

Experimental Materials:

Ten germplasm of Finger millet (Ragi) namely VL- 175, VL-149, VL-101, VL-201, VL-204, VL-315, VL-324, VL-347, VL-124, VL-146 were collected from different parts of country Kosi, Uttarakhand, Almora, Uttarakhand, Patna, Bihar, and Rachi Jharkhand were used as experimental materials in the field trail.

2016-17 (R)

Green Farming Vol. 8 (1) : 20-24 ; January-February, 2017 Research Paper

Bio-chemical evaluation of landraces/hybrid rice in Eastern Uttar Pradesh

NITIN VIKRAM[1*], RAJA HUSAIN[2], RAJ NARAYAN KEWAT[3], PRATIBHA SINGH[4] and N.A. KHAN[5]

Department of Biochemistry, N.D. University of Agril. & Technology, Kumarganj, Faizabad - 224 229 (Uttar Pradesh)

Received : 16 June 2016 ; Revised accepted : 24 December 2016

ABSTRACT

The physico-chemical characteristics such as physical (seed size, L/B ratio, grain classification), chemical (alkali spreading value, amylose content), cooking characteristics (cooking time, KLAC, elongation ratio), organoleptic quality and protein profiling were studied for landraces/hybrid rice varieties from Eastern Uttar Pradesh. Some of landraces/hybrid rice varieties are with excellent biochemical characteristics. The rice variety MEPH 113 which has good grain quality could be used in breeding programmes. Highest seed length (10.29 mm) and seed breadth (3.11 mm) and amylose content (24.53) was recorded in hybrid rice MEPH 113, whereas lowest value 7.89 mm, 2.00 mm and 14.58 for the same quality were observed in Narendra Lalmati and NDR 97 respectively. Maximum protein bands were recorded in NDR 97 and IR 64 (12) and minimum were recorded in XRA 27934. The paper has concentrated on the physical characteristics and organoleptic test and biochemical analysis with consumer preferences of rice varieties. Organoleptic analysis always helps the consumers to select better rice varieties for their consumption and use. It is also emphasized that the training and recruiting the sensory expert panel are important in the process of sensory analysis and organoleptic test. The co-efficient of correlation between L/B ratio and cooking time, alkali spreading value, amylose content was negative significant and seed length, seed breadth, KLAC were positive significant.

Key words : *Acrylamide, Alkali spreading value, Bio-chemical characters, Hybrid rice, Protein, Seed size.*

INTRODUCTION

Rice (*Oryza sativa* L.) is a member of family *Poaceae* is a cereal foodstuff which forms an important part of the diet of many people worldwide. It provides 21% of the human per capita energy and 15% of the protein globally (FAO, 2003). More than 90% of the world's rice is grown and consumed in Asia, where 60% of the calories are consumed by 3 billion Asians (Khush, 1997). India stands first in area, second in production, followed and preceded by China on these two aspects (Bajpai *et al.*, 2012). Grain quality has always been an important consideration in rice variety selection and development. Rice grain quality is a complex characteristic including many components such as appearance, cooking qualities and eating qualities (Rabiel *et al.*, 2004). Rice is consumed in the milled form, the physical attributes of the intact endosperm are of foremost importance in determining consumer preference. Therefore, the percentage of head grain, grain dimensions, weight, chalkiness, translucency of the grains, cooking and eating quality should be considered during the development of hybrid varieties (He *et al.*, 1998). The eating and cooking properties are affected by the starch, protein and protein interaction, only structural changes occur rather than the change in the starch and protein interactions.

The present investigation was carried out with the objective of studying several quantitative, qualitative and nutritional parameters among popular rice varieties of India.

MATERIALS AND METHODS

The investigations were carried out during *kharif* season 2013-14 and 2014-15 at the Student's Instructional Farm, Narendra Deva University of Agricultural & Technology, Kumarganj, Faizabad, Uttar Pradesh. Five varieties of hybrid rice Ankur 7042, XRA 27934, KPH 466, MEPH 113 and Pusa RH 42 were collected from the Crop Research Station, Masodha, Faizabad and landraces of rice Narendra Lalmati, Sarjoo 52, IR 64, Narendra 2064 and Narendra 97 collected from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Faizabad. These rice varieties were employed as the experimental material in trials. The row to row and plant to plant spacing were kept 20 cm and 15 cm, respectively. The seeds were sown at the rate of 22.5 kg

[1,2] Ph.D. Scholar *(biochemistnitin@gmail.com), [3,5] Asstt. Professor, [4] Associate Professor

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 1888-1889

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 1888-1889
Received: 07-01-2018
Accepted: 08-02-2018

JP Verma
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

RN Kewat
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pratibha Singh
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

RP Singh
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

Brijesh
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ajay Kumar
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

KK Mishra
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
JP Verma
Department of BioChemistry, Narendra Dev University of Agriculture and technology, Kumarganj, Faizabad, Uttar Pradesh, India

Biochemical composition of pearl millet germplasm collected from Eastern UP

JP Verma, RN Kewat, Pratibha Singh, RP Singh, Brijesh, Ajay Kumar and KK Mishra

Abstract
The present Investigation was carried out to study biochemical properties of pearl millet (*Pennisetum glausum* L.) genotypes. The various biochemical parameters such as corbohydrate NDBH-2(64.24g/100g), Protein Content pearl millet-3(11%), amino acids like tryptophan content NDHB-5(1.23mg/100g), lysine content NDBH-2(0.55mg/100g), Anti nutritional factors such as total phenolic content pearlmillet-5(49.69%) and tannin content pearl millet-6(1.84mg/100g) were recorded maximum in present investigation.

Keywords: pearl millet, corbohydrate, protein, tryptophan, lysine, total phenolic content, tannin content, total sugar & nonreducing sugar

Introduction
Pearl millet (*Pennisetum glaucum* L.) is also known as spiked millet, candle millet or dark millet in europe, cattail, pecillaria in USA, Bulrish millet or dukhn in Africa, Bajra, Combo or sajje in India. Pearl Millet is originated in central Africa. Pearl millet crop is grown in tropical semi-arid region of the world primarily in Africa and Asia. The hight of the pearl millet plant thay may range from 0.5-4.0 meter.

In India the major pearl millet growing states are Rajasthan, Maharasthra, Gujrat, UP and Haryana. These states together accounted for 92% of area and total pearl millet production of 9.20 million tonnes and productivity of 1161kg/ha (Anonymous, 2014) [2]. In Haryana, Pearl millet production was 8.31 lakh tonnes and productivity of 2057 kg/ha in an area of 4.04 lakh hectare, giving a yield of 1161kg/ha (Anonymous, 2014b) [3]. The starch content of pearl millet grain ranges from 62.8 to 70.5% reducing sugar from 0.1 to 0.26% pearl millet is also a good source of fat having about 4.36 to 7.11%. (Anonymous, 2015 Karamvir *et al.* 2015) It is free from major antinutrients but contain low amount of phenolics (Simwemba *et al.* 1984, kumar 2015). Total caltivated area in UP is around 0.84 million ha and production 0.95 metric tonnes. (Agriculture statistics Report 2014) People affected by gluten retated disorders such as celiac, non celiac gluten sensitivity and Wheat allergy suffers, needed gluten free diet can replaced gluten containing cereal in their diet. 100g pearl millet seed provides 11% protein, 73% corbohydrate, Mg 14mg and some other important nutrient like selenium 2.7µg (USDA).

Material and Methods
Ten germplasm of pearl millet were collected from different districts of utter pradesh namely Gonda Faizabad Balrampur Sultanpur Jaunpur Gazipur Bahraich and lakhimpur were used as experimental material. Samples of Pearl millet were brought to Biochemistry laboratary of NDUAT & Kumarganj Faizabad (UP) after collection. They were analyzed for various biochemical parameters. The collected pearl millet seed were cleaned dried and dried seeds were then crushed in pestle mortar in to powder form. The biochemical properties of the pearl millet powder were analyzed and the results were summarized. Total carbohydrate content analyzed by yamme and wills (1954) [10] Total Protein content in grain was determined by lowery's method (1951) [14] tryptophan content was estimated by the method given by spies and chamber (1949) [16], lysine content was estimated by felker *et al.* (1950), Total Phenolic content inpearl millet was analyzed by the method as described by swain and hillis (1984) [11], tannin content in pearl millet was determined by the method given by Rangana (1986).

Result and Discussion
The results on biochemical composition of pearl millet seed powder are shown in table. total corbohydrate in various germplasm was ranged between 54.42-64.24g /100g highest corbohydrate content was notieced in NDBH-2 (64.24g/100g).

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2169-2171
Received: 13-01-2018
Accepted: 14-02-2018

Harendra Singh
Assistant Professor, Department of Agriculture, BFIT Dehradun, Uttarakhand, India

RP Singh
Associate Professor, Department of Biochemistry, N.D.U.A. &T., Kumarganj, Faizabad, Uttar Pradesh, India

Divya Prakash Singh
Assistant Professor, Department of Agriculture, BFIT Dehradun, Uttarakhand, India

Pratibha Singh
Associate Professor, Department of Biochemistry, N.D.U.A. & T., Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Pratap Singh
Guest Faculty M.L.K. PG - College, Balrampur, Uttar Pradesh, India

Correspondence
Harendra Singh
Assistant Professor, Department of Agriculture, BFIT Dehradun, Uttarakhand, India

Response of organic farming on quality evaluation of rice (*Oryza sativa* L.)

Harendra Singh, RP Singh, Divya Prakash Singh, Pratibha Singh and Rajan Pratap Singh

Abstract
The present investigation entitled "Response of organic farming on quality evaluation of rice (*Oryza sativa* L.)" was carried out during *kharif* season on randomized block design with four replications in sarjoo- 52 variety. Five treatments of organic farming were taken namely T_1 (In situ decomposition of rice straw and pressmud @ 5.0 t/ha with PSM and *Azotobacter*), T_2 (In situ decomposition of rice straw and FYM @ 5.0 t/ha with PSM and *Azospirillium*), T_3 (In situ decomposition of rice straw with pressmud @ 10.0 t/ha and PSM), T_4 (In situ decomposition of rice straw with FYM @ 10.0 t/ha and PSM), T_5 (In situ decomposition of rice straw with poultry manure @ 5.0 t/ha and PSM).
Maximum and minimum test weight of rice variety was noticed in treatment T_5 (29.00g) and treatment T_3 (25.00g). Highest L: B ratio was recorded in treatment T_5 (3.00) while minimum L: B ratio was noticed in treatment T_3. Maximum starch iodine blue value was recorded in treatment T_5 (70.73%) while minimum starch iodine blue value was recorded in treatment T_4 (70.60%). The protein content was observed maximum in T_5 (8.85%) and minimum protein content was noticed in T_3 treatment (7.73%). The amylose content was noticed highest in T_5 treatment (22.90%) and minimum content was reported in T_3 treatment (20.47%). The total mineral content of rice grain was observed maximum in T_5 treatment (1.40%) while minimum content was recorded in T_3 treatment. The protein profiling of rice grain quality indicates the prominent bands showed in the T_5, T_4 and T_3 treatment while light band showed in T_1 and T_2 treatments.

Keywords: organic farming, rice, protein, amylose, total mineral, protein profiling

Introduction
Rice is the staple food of more than 60 per cent of world's population. About 90 per cent of all rice grown in the world is produced and consumed in the Asian region. In India, rice is the most important and extensively grown food crop, occupying about 44.8 million hectare of land. Organic farming refers to a particular farming system that uses organic manure, limited range of naturally derived chemicals. Organic farming uses no growth regulators, artificial additives; biosides are synthetic chemical sprays (Beharrell and Macfie, 1991) [2]. Overall goal of organic farming is to use agricultural methods that have the smallest impact of the environment and provide the largest benefits to the people (David Suzuki Foundation, 2002) [3]. The National organic board of USA defines organic farming as an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activities. The focus is on ecological compatible production system and process, not on the product itself or the specific inputs (GOI, 2001) [6]. Balance fertilization through organic soruces collectively improves the grain quality and soil health. Keeping in view the immense role of organic farming in rice crop, the present investigation entitled "Response of organic farming on quality evaluation of rice (*Oryza sativa* L.) were under taken.

Materials and Methods
The experiment was conducted at Agronomy experiment farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) in randomized block design having four replications. The experiment comprised of five treatments *viz.*, T_1 (In situ decomposition of rice straw and Pressmud @ 5.0 t/ha with PSM and *Azotobator*), T_2 (In situ decomposition of rice straw and FYM @ 5.0 t/ha with PSM and *Azospirillium*), T_3 (In situ decomposition of rice straw with Pressmud @ 10.0 t/ha and PSM), T_4 (In situ decomposition of rice straw with FYM @ 10.0 t/ha and PSM)and T_5 (In situ decomposition of rice straw with Poultry manure @ 5.0 t/ha and PSM). Rice crop (sarjoo -52) was sown at proper moisture. The test, weight was measured by electronic balance and L:B ratio was determined on the basis of average length and width of rice seed. Starch iodine blue value was

NAAS Rating - 5.21

Chemical Science Review and Letters ISSN 2278-6783

Research Article

Assessment of Some Biochemical Characters of Four Mango Verities (Mangifera *India L.*) at Different Stages of Fruit Maturity

Siya Ram[1]*, Mohammad Halim Khan[2], and R.P. Singh[3]

[1]Department of Agricultural Biochemistry, Atarra P.G. College, Atarra (B. U. Jhansi), Banda (U.P.) - 210201, India.
[2]Department of Soil Science & Agricultural Chemistry, Atarra P.G. College, Atarra (B. U. Jhansi), Banda (U.P.) - 210201, India.
[3]Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) –224229, India.

Abstract

Two sets of experiment were conducted at Mango orchard of Devgaon, Faizabad (U.P.) and SHUATS, Allahabad (U.P.) during two consecutive years of 2008-09 and 2009-10 with 4 varities of mango fruits namely "Dashehari, Langra, Chaunsa and Safeda" to asses some physicochemical and biochemical characteristics of mango fruits at 30, 60 and 90 days after fruit settings. Premature, mature and ripened fruits were evaluated for total sugar, protein, β-carotene and crude fibre content. Result revealed that highest amount of total sugar (20.62 and 20.84%), protein (0.90 and 0.91%) and β-carotene content (3031.00 and 3052.00µg/100g) at 90 days after fruit setting were recorded with Dashehari while maximum crude fibre content was noticed in Safeda (1.24 and 1.26%) at 30 days after fruit setting in 2008-09 and 2009-10 respectively. The minimum total sugar (17.26 and 17.33%), protein (0.81 and 0.83%), β carotene content (2373.00 & 2398.67 µg/100g) at 90 day, were recorded with Safeda while minimum crude fibre (0.61 & 0.62%) were recorded with Dashehari in both the year's of experiment.

Keywords: Mango, fruiting stages; Biochemical characteristics, Nutritional composition.

*Correspondence
Author: Siya Ram
Email: drsrkishanmail@rediffmail.com

Introduction

Mango (Mangifera *india L.*) belongs to the Anacardiaceae family, is one of the most important tropical fruits commercialized and consumed worldwide fresh or processed, having an attractive colour and distinct taste and aroma. India is the largest producer of mango accounting for nearly 50% of the total world production, 34.9% of the area under fruit crops in India, and 20.7% of the total fruit production of the country [1]. In Indian context, it is an important fruit crops ruling both domestic & export market. It is an excellent source of fibre and bioactive compounds such as carbohydrate, carotenoids, provitamins, vitamin C, protein, phenolics and other health promoting qualities [2]. Based on these qualities it is recognized as one of the best fruit in the world market and known as king of fruits. The biochemical composition of mango fruits differs among the cultivars and the stage of maturity. Mango fruits are highly perishable due to enzymatic and non enzymatic reaction that takes place during maturation, affecting nutritional, sensorial, physicochemical & biochemical properties. Besides riching in carbohydrates (sucrose, glucose, fructose and maltose), in mango fruits there are about twelve amino acids have been identified including the essential ones like alanine, aspartic acid, lysine, leucine, cystine, valine, arginin, phenylalanine and methionine. The highest concentrations of these amino acids are observed in fruits just after fruit set and the concentrations decreased with fruit development [3]. The aroma and flavor content were also varying widely among the mango cultivars and there is no one typical formulation of flavor component of mango fruits. In ripened mango fruits aroma and good flavor is released due to monoterpene hydrocarbons [4]. Both ripened and unripened fruits are used extensively by food processing industry to prepare variety of products, such as syrup, jam, squash, juice, cereal flakes, pickles, chutneys, candy, jam, jelly, squash, mango chips and nectar etc. [5]. Generally, mango is consumed at all stages of fruit development from the tiny imperfectly set fruits, that shed abundantly on to develop beyond the initial stage to the fully mature ones and development stages of the fruits including mature and ripened stage. Little information about some varietal physicochemical characteristics has so for been recorded [6, 7].

NAAS - 4.41

Plant Archives Vol. 18 No. 1, 2018 pp. 247-250 *ISSN 0972-5210*

EVALUTION OF NUTRITIONAL VALUE AND ANTI NUTRITIONAL FACTORS OF KODO MILLET *(PASPALUM SCROBICULATUM* L.). GERMPLASM GROWN IN EASTERN (U.P.)

Radhey Shyam[1] and R. P. Singh[2]

[1&2]Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U.P.) India

Abstract

The persent study was conducted to evalutate ten advanced germplasm of Kodo millet for nutritional and anti nutritional factors during *kharif* season 2014-15 at the students Student's Instructional Farm of Narendra Deva University Agriculture and Technology, Kumarganj Faizabad (U.P.) India. A significant variation was detected for all traits suggested that there was considerable variability among germplasm. The protein content was recorded in the range of 8.56 to 9.44 per cent Maximum protein content was recorded in the germplasm K-6 (9.44%) followed by K-10 (8.90%) The total free Amino Acid content was recorded in the range of 62.01 to 72.62 mg/100g. Maximum total free amino acid content was recorded in the germplasm K-6 (72.62 mg/100g) and total mineral was recorded in germplasm K-10 (3.31%). Curde fiber content was recorded in germplasm K-8(8.73%) and total carbohydrate content was found between ranged 63.25 to 65.28% and maximum carbohydrate found in germplasm K-5 (65.28%). Total sugar content was found in the range of 2.41 to 3.92%. Maximum total sugar was found in the germplasm K-4 (3.92%). The anti nutritional content such as tannin was found in the range of 106.38 to 124.75 (mg/100g). Phytic acid 126.38 to 136.58 (mg/100g) and total phenol 18.83 to 21.83 (mg/100g). On the basis of overall germplasm were found superior K-4, K-5, K-6, K-8, K-9 and K-10 and utilized in further research work.

Key words: Cooking attributes, kodo millet.

Introduction

Kodo millet, one of the ancient grain of the world, originated from Africa and domesticated in India few thousand years ago is a drought resistant plant. This millet crop is grown in arid and semi-arid regions of African and Asian countries. In India, kodo millet is grown mostly in the deccan region and the cultivation extends to the foothills of Himalayas.

Kodo millet (*Paspalum scrobiculatum* L.), is an indigenous cereal of India and widely distributed in damp habitats across the tropics and subtropics of the World. It occupies an area of 9.08 lakh ha with an annual production of 3.11 lakh tonnes and average productivity of 342 kg/ha (Ahmad and Yadav. 1996). Kodo millet is propagated from seed, ideally in row planting instead of broadcast sowing and its preferred soil type is a very fertile, clay based soil (Agricultural service in, 2013). The kodo millet is prone to lodging at maturity, causing loss of grain (Dewet *et al.* 1983).

The Kodo millet is mainly grown in Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Bihar, Gujarat, Uttar Pradesh, Maharashtra and Orissa. It is cultivated in U.P. mostly in Gorakhpur, Basti, Gonda, Deoria, Mirzapur and Sitapur districts. These millets are grown during *Kharif* (rainy season) and sown with the onset of the southwest monsoon. The Kodo grains are recommended as a substituted for rice to the patients suffering from diabetes.

Kodo millet contains 66.6 g of carbohydrates and 353 kcal energy per 100 g of grain, comparable to other millets. It also contains 3.6 g of fat per 100 g. It provides minimal amounts of iron, at 0.5mg/100 mg, and calcium, 27mg/100 mg. Kodo millet also contain high amounts of polyphenols, an antioxidant compound. (Hedge and Chandra, 2005). Kodo and little millets can be used for preparation of malted and alcoholic beverage production. (Nikita Sethi 2016).

Kodo millet is very easy to digest, it contains a high amount of lecithin and is excellent for strengthening the

PlantArchives Vol. 18 No.1, 2018 pp. 144-146 ISSN 0972-5210

STUDIES ON PHYSICALAND BIOCHEMICAL CHARACTERISTICS OF KODO MILLET GERMPLASM [*PASPALUM SCROBICULATUM* L.]

Radhey Shyam[1] and R.P. Singh[2]

[1&2]Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U.P.) India

Abstract

Millets are one of the oldest foods known to humans and cultivated since time immemorial. Kodo millet [*Paspalum Scrobiculatum* L.] is nutritious, healthy and versatile and hence would be a worthy addition to one's diet. Significant differences in nutrient composition and physico-chemical characteristics were observed of kodo millet. Moisture content of kodo millet seed was observed on the range 7.25 to 10.03 percent. Diameter of seed (1.71-1.97mm). kodo millet exhibited excellent cooking attributes The cooking time ranged from 9.61 -12 .21 minutes. Amino acids namely methionine was recorded (72.79 to 94.34 mg/g), Trypto Phane found in range (25.55 to 33.27 mg/g) and lysine was recorded (135.17 to 179.17 mg/g). The reducing sugar was found in the range (1.27 to 1.72 %) and non reducing sugar was recorded between (1.02 to 2.65 %). Followed by germplasm K-7 (2.21 %). On the basis of overall germplasm were found superior K-2, K-6, K-8, K-9 and k-10 and utilized in further research work.

Key words: Cooking attributes, kodo millet

Introduction

Kodo millet (*Paspalum Scrobiculatum L.*) is a group of grassy plant with short slender culm and small grains possessing remarkable ability to survive under severe drought. Kodo millet is multipurpose crop which is cultivated for food and fodder it can be cultivated in all types of soil and sustains adverse climatic condition. It is fast growing millet, occasionally producing ripe grains in 40 days after seedling (Nagar and Sharma 2005). Nutritionally kodo millet is an important crop and a good source of protein, which is highly digestible and is an excellent source of dietary fibre with good amounts of soluble and insoluble fractions. The carbohydrate content is low and slowly digestible, which makes the kodo millet a nature's' gift for the modern mankind who is engaged in sedentary activities. Moisture content determines the shelf life and milling characteristics of the grains it is interesting to note that kodo millet exhibited lower moisture content than other minor millets such as Proso, Little, Foxtail and Kodo millet with values ranging from 10.60 to 15.00 percent (Kulkarni and Naik 1999)

The Kodo millet is mainly grown in india, Pakistan, philipinse, indonacia weaitname, Thailand west affrica. It is measurd food source in the decame flatau of india. Kodo millet is nutrouse grown and good substituted in rice or weight the nutricutical composition. mainely protein fiber and mineral content are much hair the maijor cerial in rice. The kodo millet grain composed on 8 per cent protein the maijor protein fraction in kodo millet in glutein it is an excellent source of fiber 9 per cent as compare to rice (0.2%) and wheight (1.2%).

The nutritive value of millet is comparable to other staple cereals like wheat and rice; some of them are even better with regard to average protein, fat and mineral contents (Gopalan *et al.* 2007). Minor millets have also excellent nutritional value in view of their good protein content and better amino acid profile. Their starch composition and low glycemic index (which make them ideal for diabetic patients) are also accompanied by gluten free status of the flour, thus making them very suitable for the preparation of weaning products.

Millet is the richest source of Ca among cereals (340 mg/100g) of which only 162 mg/100 g is bioavailable in the raw grain. Processing improved its bioavailability up to 227 mg/100 g. Iron availability improved from 0.34 to 1.4 mg/100g due to processing Total free amino acids

NAAS - 5.38

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 2801-2805

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 2801-2805
Journal homepage: http://www.ijcmas.com

Original Research Article

Biochemical Evaluation of Mineral Profile and Ascorbic Acid Content in Various Varieties of Ripened Mango (*Mangifera indica* L.) Fruits

Siya Ram[1]* and R.P. Singh[2]

[1]Department of Agriculture Biochemistry, Atarra P. G. College, Atarra, Banda (U.P.)-210201 (Affiliated to B.U. Jhansi), India
[2]Department of Biochemistry, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.)-224229, India
Corresponding author

ABSTRACT

The present investigation was conducted in four varieties of mango fruits namely Dashehari, Langra, Chausa and Safeda during 2008-09 and 2009-10. All the varieties of mango were collected from orchard of Devgaon, Faizabad (U.P.) to study the mineral profile and ascorbic acid content of mango fruits at 30 days, 60 days and 90 days after fruit setting. Mineral makeup was evaluated for important mineral content i.e. Ca, Mg, K, P, Fe and S. The result showed high variation among the mineral makeup and ascorbic acid content of ripened mango fruits. Highest amount of Ca, Mg, K, P, Fe and S content were noticed in Safeda (0.142%), Dashehari (0.254%), Dashehari (146.01 ppm), Safeda (0.022%), Safeda (0.673%) and Safeda (0.052%) respectively while lowest content were found in Chausa (0.138%), Chausa (0.189%), Chausa (108.66 ppm), Chausa (0.019%), Langra (0.622%) and Chausa (0.032%) respectively during ripened state in 2008-09. In 2009-10, the highest such mineral content were recorded in Langra (0.136%), Chausa (0.344%), Safeda (117.89 ppm), Dashehari (0.022%), Safeda (0.682%) and Safeda (0.038%) respectively, whereas lowest amount were observed in Safeda (0.128%), Dashehari (0.165%), Dashehari (78.96 ppm), Langra (0.017%), Dashehari (0.058%) and Dashehari (0.35%) in ripened fruits. Ascorbic acid content in mango fruits at different stages was observed between 13.37-26.33 mg/100g in 2008-09 and 14.67-27.33 mg/100g in 2009-10.

Keywords

Mango, Fruiting stage, Biochemical characteristics, Mineral profile, Ascorbic acid

Introduction

Mango (*Mangifera indica* L.) belongs to the family Anacardiaceae, is one of the most important tropical fruits commercialized and consumed worldwide fresh or processed, having an attractive colour and distinct taste and aroma. India is the largest producer of mango accounting for nearly 50% of the total world production, 34.9% of the area under fruit crops in India, and 20.7% of the total fruit production of the country (1). In Indian context, it is an important fruit crops ruling both domestic & export market. It is an excellent source of fibre and bioactive compounds such as carbohydrate, carotenoids, provitamins, vitamin C, protein, phenolics and other health promoting qualities (2). Mango is the main fruit of Asia and developed its own importance all over the world. Being an useful and delicious fruit, it was the part of culture and religion

J. Exp. Zool. India Vol. 21, No. 1, pp. 383-387, 2018 | www.connectjournals.com/jez | ISSN 09

BIOCHEMICAL STUDIES OF SMALL FISHES EXISTING IN EASTER UTTAR PRADESH

Dharmadew Chauhan* and R. N. Kewat

Department of Ag. Biochemistry, College of Agriculture, N.D. University of Ag. Technol., Kumarganj, Faizabad - 224 229,
e-mail : dharmadevchauhan@gmail.com

(Accepted 30 December 2017)

ABSTRACT : Fisheries play a promising role in socio-economic development by providing nutritional security for the I population and contribute to the economic upliftment of fisher folks. A total of 15 major 45 medium and over 102 minor of the country provide one of the richest fish resources of the world. It is however 15 major rivers that covers 83% of dra basin accounts for 85% of surface fold. The Uttar Pradesh has vast potential of aquatic resources and that offer consid scope for development of inland fisheries and aquaculture.

The fresh water resources of Uttar Pradesh have total area of 1, 61,372 hectare. Out of 123 species recorded in Uttar Pra about 33% are Ornamental fishes, rest 77% are potential food fishes and 10% are potential sport fishes. In India total species of fishes have been recorded – Freshwater species recorded are 877,113 are brackish and 1563 are from the water environment.

On the basis of the results obtained from the present study, it may be concluded that application of small indigenous f collected from Kushinagar, Gorakhpur and Faizabad district of Eastern Uttar Pradesh resulted in:-The healthy fish selected for the present investigations for morphometric and proximate compositions. The biochemical observations i present investigation shows carbohydrate ranges between 0.17-7.70%, protein 14.26-20.57%, reducing sugar 10.31-25.4 100g, non-reducing sugar 13.23-29.73 mg/100g, total sugar 23.85-56.48 mg/100g, total moisture 71.00-78.67%, fat 4.29%, total mineral content 1.11-4.26%,calcium 166.67-1197.00 mg/100g, phosphorous 113.00-351.67 mg/100g, iron 33.57 mg/100g, tryptophan 0.96-1.67g/16gN, methionine 0.14-2.40g/16gN,and lysine3.25-6.95 g/16gN. The Statistical sup morphometric enriched biochemical composition in *Puntius chola* and *Puntius ticto* species while *Chela bacalla* species less Morphometric but enriched in biochemical composition. The *Colisa fasciata* and *Puntius sarana* species are ri mineral content.

Key words : Small fishes, biochemical parameters.

INTRODUCTION

Fisheries play a promising role in socio-economic development by providing nutritional security for the Indian population and contribute to the economic upliftment of fisher folks. A total of 15 major 45 medium and over 102 minor rivers of the country provide one of the richest fish resources of the world.

The Uttar Pradesh has vast potential of aquatic resources that offer considerable scope of inland fisheries development and aquaculture. The four major constituents in the edible portion of fish are water, protein, lipid (fat or oil) and ash (minerals). Proper knowledge on the biochemical composition of fish finds application in several areas. Today there is an ever-increasing awareness about health foods and fish is finding more acceptances because of its special nutritional qualities. In this context, a proper understanding about the biochemical constituents of fish less become a primary requirement for nutritionists and dieticians.

Fish and fishery products are used in animal fe Fish as a whole is considered to have a great pote for food and thus can be expected to provide relief f malnutrition. Also, it is a very good source of prot have a high content of water and lipid soluble vitam minerals and polyunsaturated fatty acids (PUFAs) c 3 family. It is believed that Omega-3 fatty acids f fish can lower body triglycerides thus reducing chances of heart diseases. Fish also reduces bl pressure by small but significant amounts and impr blood clotting regulation. Fish however, is very suscept to microbial and chemical deterioration like lipid oxidat hydrolysis and protein denaturation etc.

The nutritional and medicinal value of fish has b recognized from time immemorial (Srivastava, 19

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4567-4573.

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 4567-4573
Journal homepage: http://www.ijcmas.com

Original Research Article

Comparative Grain Quality Evaluation of Rice Varieties

Nitin Vikram[1*], R. N. Kewat[1], N. A. Khan[2], Raja Husain[2] and Kunvar Gyanendra[2]

[1]Department of Biochemistry, N. D. University of Agriculture and Technology, Kumarganj, Faizabad, India
[2]Department of Biotechnology, N. D. University of Agriculture and Technology, Kumarganj, Faizabad, India
**Corresponding author*

ABSTRACT

Rice is rich in genetic diversity, with thousands of varieties grown throughout the world. Rice cultivation is the principal activity and source of income for about 100 million households in Asia and Africa. Rice has potential in a wide range of food categories. Besides having nutritional and medicinal benefits, the byproducts of rice are equally important and beneficial. By-products from growing rice create many valuable and worthwhile products. Rice grain quality characteristics such as physiological and chemical based on consumer preferences like appearance, cohesiveness, tenderness on touching, chewing, taste, aroma, elongation and overall acceptability were studied for hybrid and landraces/traditional rice varieties.

Keywords
Grain, milling, organoleptic, kernel length and variety

Introduction

Rice (*Oryza sativa* L.) is a plant belonging to the family of Poaceae. It is one of the three major food crops of the world and forms the staple diet of about half of the world's population. The global production of rice has been estimated to be at the level of 650 million tones and the area under rice cultivation is estimated at 156 million hectares (FAOSTAT, 2008). Physiological characters of the plant are inherent characters determining the crop yield which plays an important role in variety selection (Miah *et al.*, 1996). Keeping the quality of aroma and other grain quality in aromatic fine rice is a big challenge as yield is inversely related to protein and aroma content (Terman, 1969). Hybrid rice is reported to contribute 5.6% of India's total rice production, nearly 15 years after its introduction and promotion. Hybrid rice is used in several preparations and has commercial and industrial importance. Besides grain its straw is used as fodder, packing insulation materials and in the manufacturing of the card board etc. In the Asian diet rice contributes almost 28- 54% proteins. Rice provides 27% of the world nutritional energy and 20% of overall nutritional protein (Bashir *et al.*, 2007). Grain quality in rice is very difficult to define with precision as preferences for quality vary from country to country. The cooking quality preferences vary in different countries (Azeez and Shafi, 1966). The aim of this study was to determine the physicochemical characteristics of selected

Journal of Pharmacognosy and Phytochemistry 2018; SP2: 238-242

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 238-242

Shivendra Kumar Vishwakarma
Lecturer, CCSPG College, Barabanki, Department of Biochemistry, N. D. University of Agriculture and Technology Kumarganj, Faizabad, Utter Pradesh, India

RP Singh
Associate Professor, Department of Biochemistry, N. D. University of Agriculture and Technology Kumarganj, Faizabad, Utter Pradesh, India

Pratibha Singh
Associate Professor, Department of Biochemistry, N. D. University of Agriculture and Technology Kumarganj, Faizabad, Utter Pradesh, India

RN Kewat
Assistant professor, Department of Biochemistry, N. D. University of Agriculture and Technology Kumarganj, Faizabad, Utter Pradesh, India

Correspondence
Shivendra Kumar Vishwakarma
Lecturer, CCSPG College, Barabanki, Department of Biochemistry, N. D. University of Agriculture and Technology Kumarganj, Faizabad, Utter Pradesh, India

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018)

Periodical evaluation of enzymes and pigments in mango varieties during storage in card board carton by post harvest application of salicylic acid

Shivendra Kumar Vishwakarma, RP Singh, Pratibha Singh and RN Kewat

Abstract
Four varieties of mango namely Dashahari, Langra, Chausa and Safeda had been taken for the experiment. At maturity condition, mango fruits were harvested and stored in cardboard carton by post harvest application of salicylic acid at 0.1, 0.5 and 1.0 g/l doses. The analysis of pectin methyl esterase, cellulase, polyphenol oxidase, peroxidase, total chlorophyll and beta carotene were done at five days intervals after storage. Highest pectin methyl esterase enzyme activity (0.91 units/g) was reported in variety Dashahari at five days ambient storage period by 1.0 g/l salicylic acid application. Maximum cellulase and polyphenol oxidase enzyme activity (12.84 and 56.38 units/g) was reported in the variety Dashahari at five days ambient storage period by 0.1 g/l salicylic acid application. Highest peroxidase enzyme activity (463.69 units/g) was reported in variety Dashahari at 20 days ambient storage period after the application of 0.5 g/l salicylic acid treatment. Maximum total chlorophyll content (39.86 mg/g) was reported in the variety Dashahari at five days storage by 1.0 g/l salicylic acid application. Highest beta carotene content (3495.93 µg/100g) was reported in the variety Dashahari at 20 days ambient storage period by 0.5 g/l salicylic acid treatment. The present study indicated that after salicylic acid application pectin methyl esterase, cellulase, polyphenol oxidase and chlorophyll content decreased but the peroxidase and beta carotene content increased during storage in cardboard carton

Keywords: enzymes, pigments in mango, card board carton, salicylic acid

Introduction

The total production of fruits and vegetables in the world is around 370 million tonnes. India ranks first in the world with an annual output of 32 million tonnes fruits; accounts for about 8 per cent the world fruits production (N.H.B. database, 2011) [20]. The total production of mango fruit in India is 15188 million tonnes with an area of about 2297 hectare. The biochemical composition of mango fruit differs among the cultivars and the stage of maturity. Mango fruit is rich in carbohydrates, carotenoids, organic acids, polyphenols, vitamins and minerals etc. A comprehensive report has been made on the biochemical composition after analysis of more than 25 varieties of mango is moisture 73.0 - 86.7 per cent, carbohydrate 11.6 – 24.3 per cent, protein 0.5 – 1.0 per cent, minerals 0.3 – 0.7 per cent, beta carotene 6375 – 20750 µg/ 100 g, vitamin C 6.8 – 38.8 mg/ 100 g (Anonymous, 1994) [2]. According to the Ministry of Food Processing Industry statement " the lack of processing and storage of fruits and vegetables results in huge wastages estimated at about 35 per cent the value of which is approximately Rs. 33000 crores for perishable and Rs. 15000 crores for non-perishable annually."

A worldwide increase in the demand of fresh mango fruit is being observed, increasing the prospect for producing countries (Amin *et al*., 2007) [1]. However, like all other fresh commodities, its market potential is also linked with the fruit quality and market access (Anwar and Malik, 2007) [3], whereas certain postharvest factors, like insect-pest and disease management, are important from production point of view, proper post-harvest treatments and packaging are required for maintaining better quality, extended shelf life and having access to international markets (Anwar and Malik, 2007) [3].

Salicylic acid (SA) is a colourless, crystalline organic carboxylic acid which is found in plants, especially in fruits, in the form of methyl salicylate. It is also known as 2-hydroxybenzoic acid, with functions as a plant hormone. Most investigators have focused on the role of

Mass Rating 5.21

Journal of Pharmacognosy and Phytochemistry 2018; 7(3): 1541-1545

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(3): 1541-1545
Received: 01-03-2018
Accepted: 03-04-2018

Radhey Shyam
Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RP Singh
Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Radhey Shyam
Department of Biochemistry, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Evalution of physiological characteristics, nutritional composition and anti-nutritional factors of kodo millet *(Paspalum scrobiculatum* L.*)*. Germplasm grown in eastern U.P.

Radhey Shyam and RP Singh

Abstract
The present study was conducted to evalutate ten advanced germplasm of kodo millet for physiological traits, nutritional composition and anti-nutritional factors during khrif season 2014-15 at the student's Instructional Farm of Narendra Deva University Agriculture and Technology, Kumarganj Faizabad (U.P.) India. A significant variation was detected for all traits suggested that there was considerable variability among germplasm. Moisture content of kodo millet seed was observed in the range 7.25 to 10.03 percent. The yield/ear of kodo millet germplasm was found in the range of 12.24 to 15.82 q/h. The test weight in various germplasm was found in the range of 3.39 to 5.19 g seed. The protein content was recorded in the range of 8.56 to 9.44 per cent Maximum protein content was recorded in the germplasm K-6 (9.44%) followed by K-10 (8.90%) The total free Amino Acid content was recorded in the range of 62.01 to 72.62 mg/100g. Maximum total free amino acid content was recorded in the germplasm k-6 (72.62 mg/100g). Amino acids namely methionine was recorded (72.79 to 94.34 mg/g), Trypto Phane found in range (25.55 to 33.27 mg/g) and lysine was recorded (135.17 to 179.17 mg/g). And total mineral was recorded in germplasm k-10 (3.31%). Highst curde fiber content was recorded in germplasm k-8(8.73%) and total carbohydrate content was found between ranged 63.25 to 65.28% and maximum carbohydrate found in germplasm K-5 (65.28%). The reducing sugar was found in the range (1.27 to 1.72%) and non-reducing sugar was recorded between (1.02 to 2.65%). followed by germplasm K-7 (2.21%). Total sugar content was found in the range of 2.41 to 3.92%. Maximum total sugar was observed in the germplasm K-4 (3.92%). The anti-nutritional content such as tannin was found in the range of 106.38 to 124.75 (mg/100g). Phytic acid 126.38 to 136.58 (mg/100g) and total phenol 18.83 to 21.83 (mg/100g). Minimum tannin content (109.85 mg/100g) was found in germplasm K-6.while lowest in germplasm KK-1. Minimum phytic acid (126.91 mg/100g) was found in germplasm K-6. While lowest in germplasm KK-1. Minimum total phenol content (19.50 mg/100g) was found in germplasm K-10. While lowest found in germplasm K-6. On the basis of overall germplasm were found superior K-4, K-5, and K-6, K-8, K-9 and k-10 and utilized in further research work

Keywords: Tannin, phytic acid, total phenol, reducing sugar, free amino acids

Introduction

Kodo millet, one of the ancient grains of the world, originated from Africa and domesticated in India few thousand years ago is a drought resistant plant. This millet crop is grown in arid and semi-arid regions of African and Asian countries. In India, kodo millet is grown mostly in The Deccan region and the cultivation extends to the foothills of himalayas.

Kodo millet, (*Paspalum scrobiculatum* L.), is an indigenous cereal of India and widely distributed in damp habitats across the tropics and subtropics of the World. It occupies an area of 9.08 lakh ha with an annual production of 3.11 lakh tonnes and average productivity of 342 kg/ha. (Ahmad and Yadav. 1996) [2]. Kodo millet is propagated from seed, ideally in row planting instead of broadcast sowing and its preferred soil type is a very fertile, clay based soil. (Agricultural service in, 2013) [1]. the kodo millet is prone to lodging at maturity, causing loss of grain. (Dewet *et al.* 1983).

The kodo millet is mainly grown in Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Bihar, Gujarat, Uttar Pradesh, Maharashtra and Orissa. It is cultivated in U.P. mostly in Gorakhpur, Basti, Gonda, Deoria, Mirzapur and Sitapur districts. These millets are grown during Kharif (rainy season) and sown with the onset of the southwest monsoon. The kodo grains are recommended as a substituted for rice to the patients suffering from diabetes.

Kodo millet contains 66.6 g of carbohydrates and 353 kcal energy per 100 g of grain, comparable to other millets. It also contains 3.6 g of fat per 100 g: It provides minimal amounts of iron, at 0.5mg/100 mg, and calcium, 27mg/100 mg. Kodo millet also contain high

International Journal of [illegible] Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(4): 144-148
© 2018 IJCS
Received: xx-05-2018
Accepted: xx-06-2018

Shivendra Kumar Vishwakarma
Lecturer, CCSPG College Bardari, Barabanki, Associate Professor, Assistant professor, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

RP Singh
Lecturer, CCSPG College Bardari, Barabanki, Associate Professor, Assistant professor, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Pratibha Singh
Lecturer, CCSPG College Bardari, Barabanki, Associate Professor, Assistant professor, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

RN Kewat
Lecturer, CCSPG College Bardari, Barabanki, Associate Professor, Assistant professor, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Correspondence
Shivendra Kumar Vishwakarma
Lecturer, CCSPG College Bardari, Barabanki, Associate Professor, Assistant professor, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Impact of salicylic acid and card board carton on quality attributes of mango varieties

Shivendra Kumar Vishwakarma, RP Singh, Pratibha Singh and RN Kewat

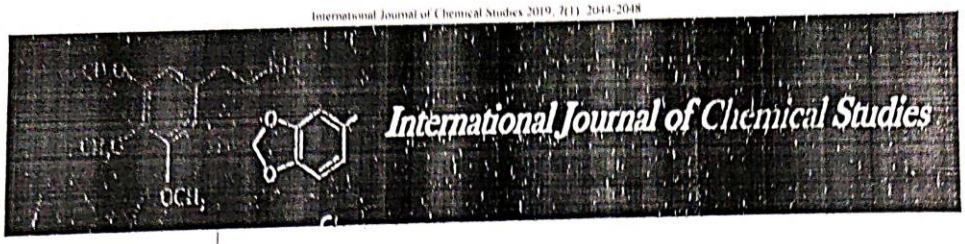
Abstract
The present investigation had sixteen treatment combinations, which had been replicated three times and was laid out in Completely Randomized Design. At maturity condition mango fruits were harvested and stored in cardboard card board carton by post harvest application of salicylic acid at 0.1, 0.5 and 1.0 g/l doses. The data revealed that lowest physiological loss weight (2.12 %) was recorded in Langra variety at five days storage by 0.5 g/l salicylic acid application. Maximum pectin content (1.96 %) was recorded in Langra variety at 15 days ambient storage period by 0.5 g/l salicylic acid application. Highest pectin methyl esterase (0.91 units/g) reported in variety Dashahari at 5 days storage by 1.0 g/l salicylic acid application. The highest polyphenol oxidase enzyme activity (56.38 units/g) was noticed in variety Dashahari at 5 days storage by 0.1 g/l salicylic acid treatment. Highest peroxidase activity and beta carotene content (463.69 units/g and 3495.93 µg/100g) was reported in Dashahari variety at 20 days ambient storage period by 0.5 g/l salicylic acid application. Maximum TSS content (28.00 Brix°) was reported in variety Chausa at 20 days ambient storage period by 0.5 g/l salicylic acid treatment. Thus the presented study indicated that salicylic acid enhanced the TSS, beta carotene, peroxidase activity but decreased the polyphenol oxidase and pectin methyl esterase enzyme activity. Salicylic acid significantly decreased the physiological loss weight during storage in cardboard carton.

Keywords: mango, salicylic acid, card board carton, PME, polyphenol oxidase, peroxidase, TSS, beta carotene, physiological loss weight

Introduction
India is an agriculture based country where, different types of fruits and vegetables are grown. The total production of fruits and vegetables in the world is around 370 million tonnes. India ranks first in the world with an annual output of 32 million tonnes fruits; accounts for about 8 per cent the world fruits production [1]. The total production of mango fruit in India is 15188 million tonnes with an area of about 2297 hectare. The mango fruit has been cultivated in Indian sub-continent for over 4000 years and has been the favorite of the Kings and commoners because of its nutritive values, taste, attractive fragrance and health promoting qualities and now it is recognized as one of the best fruit in the world market and also designated as 'King of Fruits'. The biochemical composition of mango fruit differs among the cultivars and the stage of maturity. Mango fruit is rich in carbohydrates, carotenoids, organic acids, polyphenols, vitamins and minerals etc.
According to the Ministry of Food Processing Industry statement '' the lack of processing and storage of fruits and vegetables results in huge wastages estimated at about 35 per cent the value of which is approximately Rs. 33000 crores for perishable and Rs. 15000 crores for non-perishable annually.'' Due to mishandling, inadequate storage or lack of post harvest technical knowledge, producer and traders have to face about 30-40 per cent losses [2]. Spoilage of mango due to end rot and anthracnose limit its storage potential and the shelf life is decided on the basis of spoilage during storage. The loss of water from fruit is due to skin evaporation (transpiration) and to some extent respiration. When the fruit losses weight, shriveling will occur and the appearance will deteriorate, thus reducing its market value [3].
Salicylic acid (SA) is a colourless, crystalline organic carboxylic acid which is found in plants, especially in fruits, in the form of methyl salicylate. It is also known as 2-hydroxybenzoic acid with functions as a plant hormone. Most investigators have focused on the role of salicylic acid in induction of disease resistance. Exogenous supply of salicylic acid has been reported to delay the ripening of apples [4], peach [5], persimmon [6], mango and tomato fruits [7] probably

NAAS Rating – 5.31

International Journal of Chemical Studies 2019; 7(1): 2044-2048



P-ISSN: 2349–8528
E-ISSN: 2321–1902
IJCS 2019; 7(1): 2044-2048
© 2019 IJCS
Received: 26-11-2018
Accepted: 30-12-2018

Shilpa Singh
Department of Biochemistry, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

RP Singh
Department of Biochemistry, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Correspondence
Shilpa Singh
Department of Biochemistry, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Studies on biochemical parameters of hybrid rice varieties in the Faizabad region of eastern Uttar Pradesh, India

Shilpa Singh and RP Singh

Abstract
The experiment was carried out at the Department of Biochemistry, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad as a part of PhD work. The seven varieties of hybrid rice namely- Dhani, US-312, 6201, 6302, 6444, JK-401, PHB-71 and 3 check varieties namely- Swarna, Sambhamah and Pusa Basmati were purchased from local market at Kumarganj, Faizabad from year 2012 to 14. The results highlighted that, the variety Pusa Basmati found highly superior overall the varieties and noticed, highest reducing sugar (0.34%), protein (8.43%), tryptophan (0.21 /16g N) and methionine (2.16g/16g N) content.
The highest (1.80 %) total mineral content found in Sambhamah followed by (1.66 %) Pusa Basmati and found highly significant and superior over 6201 and lysine (2.13g/16g N) followed by (1.92g/16g N) 6444 over US-312. The highest (74.71%) carbohydrate content was recorded in Swarna followed by (72.92%) Dhaniand highly superior over 6302. Like vise the variety PHB-71 found highest (1.52%) total sugar content followed by (1.25 %) Pusa Basmati and highly superior over 6302.

Keywords: carbohydrate, protein and total mineral, tryptophan, methionine and lysine

1. Introduction
Rice (*Oryza sativa* L.) is a plant belonging to the family of grasses, Poaceae. It is one of the three major food crops of the world with respect to acreage and production and forms the staple diet of about two third of the world's population. More than 90 per cent of the rice produced and consumed in Asian countries. Asia is the leader in rice production accounting for about 90 per cent of the world's production. Over 75 per cent of the world supply is consumed by people in Asian countries and thus rice is of immense importance to food security of Asia. In India, the rice is cultivated on 43.81 million hectare with production of 96.43 million tones (Anonymous, 2010) [1]. The demand for rice is expected to increase further keeping in view the expected increase in the population.
The projected demand for rice can only be met by maintaining steady increase in production over the years. Several breeding strategies are being employed in increasing the yield potential of rice and those among the available strategies; hybrid rice offers an immediate opportunity to break the yield plateau set by the semi-dwarf rice varieties after the first green revolution. In the recent years, much emphasis is given for the cultivation of hybrid varieties. Hybrid rice technology has proved to be one of the most feasible and readily adoptable approaches to break the yield barrier, as they produced about 15-20 per cent more than the best of the improved or high yielding varieties. Being convinced of the potential of hybrid rice technology in enhancing the production, India adopted this technique and has released nearly more than forty-three hybrids for commercial cultivation. Hybrid technology has been widely acclaimed and accepted. Hybrid rice is the commercial rice crop from F1 seeds of cross between two genetically dissimilar parents. Good rice hybrids have potential of yielding 15-20 per cent more than the best inbred variety grown under similar conditions (Nguyen van Suan, 1998) [10]. Hybrid rice was introduced commercially in China in 1976.
Keeping in view of above facts, potentially inclination towards hybrid rice by developed country and having vital chemical constituents hidden in it, the present study have been conducted.

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 993-995 (2017)

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

NUTRITIONAL AND ANTI-NUTRITIONAL CONTENTS IN FOXTAIL MILLET (*SETAF ITALICA* L.) GENOTYPES COLLECTED FROM EASTERN U.P.

R.N. Kewat, C.P. Patel, R.P. Singh, Pratibha Singh, Ramesh P. Singh, and Chetna Gangwar
Department of Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad 224229 U.P, Indi
**E-mail : mkfzd73@gmail.com*

ABSTRACT

The present paper describes some of the important facts relating to nutritional and anti-nutrional properties of foxtail millets. The various biochemical parameters such as protein content Kakun-2 (13.00%), carbohydrate content Kakun-6 (75.00%), crude fibre content Kakun-6 (8.25%), Total mineral content Kakun-2 (3.72%), tryptophan content Kakun-6 (38.73 mg/g protein), lysine content Kakun-2 (26.64mg/100g) were also noticed in present investigation. Antinutritional factor such as Total phenol content Kakun-2 (2.10%) and Phytic Acid content Kakun-2 (115.51mg/100g) were found reported minimum in the present germplasm. So the germplasm were utilized in the further research work.

Key word : *Foxtail millet, Protein, Total mineral, carbohydrate, Total sugar and reducing sugar, Total phenol, Phytic acid.*

Foxtail millet (*Setaria italica*) is belongs to the family Poaceae, subfamily Panicoideae. It is known by different names in different languages stich as kaon (Bengali), kanghu (proya), korra (Telugu), tenai (Tamil), thana (Malayalam), navane (Kannada), kangni (Punjabi), kakun(Hindi) and kang (Marathi).A self-pollinating crop with chromosome number 2n=18. Foxtail millet is an annual grass with slim, vertical, leafy stems which can reach a height of 120-200 cm (Baker, 1998). Foxtail millet is tasty, with a mildly sweet, nut-like flavour and contains a myriad of beneficial nutrients. It is nearly 10-13% protein, contains moderate amounts of fibre, B-complex vitamins including niacin, thiamin, and riboflavin, the essential amino acid methionine, lecithin, and some vitamin E. It is particularly high in the minerals iron, magnesium, phosphorous, and potassium. The seeds are also rich in photochemicals, including phytic acid, which is believed to lower cholesterol, and phytate, that is associated with reduced cancer risk (FAO, 2008). It is also being used traditionally for feed supplement for pregnant mother and under 3 years old baby in Numfor Island (Rumbrawer, 2003). They are consumed traditionally as health and vitality foods by the labour class. Foxtail yellow seeded cultivars, medicinally used as astringent, digestive, emollient and stomachic. It is also used in the treatment of dyspepsia, poor digestion and food stagnancy in abdomen. In the northern area of China it has been widely used as a nourishing gruel or soup for pregnant and nursing women, and has been applied in food therapy. Foxtail millet is highly nutritious, non-glutinous, and like buckwheat and quinoa, is not an acid forming food so it is soothing and easy to digest. It is considered to be one of the least allergenic and most digestible grains available and it is a warming grain that helps to heat the body in cold or rainy seasons and climates (Kamara *et al.*, 2009).

MATERIALS AND METHODS

Experimental Materials : Ten varieties of foxtail millet genotypes were selected as the experimental material o the farmers field of different districts of U.P. Samples c Foxtail millets were brought to Biochemistry laboratory o Narendra Deva University of Agiculture & Technology Kumarganj Falzabad (U.P.) after collection.. Foxtail millet were collected and analyzed for various biochemica parameters. The collected foxtail millet were cleaned dried. The dried seeds was then crushed by a pestle and mortel. Finally, the product was the desired foxtail millet powder. The chemical properties of the foxtail millet powder were analysed and the results are summarized. Protein content analysed by Lowry's method (1951) by .Total carbohydrate content analysed by Yamme and Wills (1954). Total sugar content analysed by Dubois *et al.* (1950) using phenol reagent. Reducing sugar estimated by Miller (1959). Total mineral content was estimated by the method as described by Hart and Fisher (1971). The content of crude fibre in dried foxtail powder were analysed by the method as described by Hart and Fisher (1971). Total phenol analysed by the method of Swain and Hillis (1984) and phytic acid estimatrd by the method of Wheeler and Ferrel (1971).

RESULTS AND DISCUSSION

The results on identity, strength and assay of foxtail millet seed powder and proximate composition are shown in Table 1, 2 and 3. Protein content in various germplasm was obtained between 11.85 to 13.00 per cent. Maximum protein content was recorded in the germplasm Kakun-2 (13.00%) statistical analysis of the data showed that all the germplasm of Foxtail millets were found significant regarding protein content. Studied on protein contents found similar range of protein (Mohamed *et. al.* 2009). Analyzed nutritional composition and found that millet

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special Issue [5] 2017: 584-586
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE OPEN ACCESS

Evaluation of pearl millet germplasm using physico biochemical traits collected form Eastern U.P.

Jai Prakash Verma, R. N. Kewat, R. P. Singh, Pratibha Singh and R. K. Yadav
Dept. of Biochemistry, N.D.U.A & T. Kumarganj, Faizabad
*Corresponding author: Jayprakashverma54@gmail.com

ABSTRACT

The present investigation was carried out to study the physical and biochemical properties of Pearl millet (Pennisetum glaucum L.) genotypes. The kernel husk ratio in Pearl millet germplasm was found in the range of 64:36 to 80:20.The colours of Pearl millet were very attractive with Pale yellow and light gray. The colour plays an important role as far as consumer's acceptance is concerned. The average test weights of grain sample taken for the study were noticed between 5.35 to 12.98 of Pearl millet germplasm, respectively. The various biochemical parameters such as Carbohydrate content NDBH-2 (64.24g/100g), crude fibre content in Pearl millet-4 (2.30g/100g), Total mineral content in Pearl millet-3 (2.26 g/100g) were also noticed in present investigation.

Key word: Pearl millet, total mineral, carbohydrate, crude fibre and seed colour of seeds.

Received 21.09.2017 Revised 24.10.2017 Accepted 03.11.2017

INTRODUCTION

Pearl millet (*Pennisetum glaucumL*) is also known as spiked millet, candle millet or dark millet in Europe; cattail, pecillaria in USA; bulrish millet or dukhn in Africa; bajra, combo or sajje in India. Pearl millet is originated in central Africa. Pearl millet crop is grown in tropical semi-arid region of the world primarily in Africa and Asia. Pearl millet is well adapted to production system characterized by low rainfall (200-600 mm), low soil fertility and high temperature. Pearl millet belongs to the family gramineae (Poaceae, Grass family). The height of the pearl millet plant may range from 0.5 – 4.0 meter. The grains color may be nearly white, pale yellow, brown, grey, salt blue or purple. The grains of the pearl millet are about 3 to 4 mm long much longer than those of other millets. The weight of seeds usually ranges from 1.4 to 2.5g with a typical mean of 0.8gram [1]. India is the largest producer of pearl millet covering about 8.7 million ha of marginal and sub marginal lands. Rajasthan, Gujarat, Haryana, Uttar Pradesh and Maharashtra are the fifth important states cultivar of these crops. Total cultivated area of Pearl millet in Uttar Pradesh is around 0.84 million ha and production 0.95 metric tonns. [2]. People affected by gluten related disorders, such as celiac, non-celiac gluten sensitivity and wheat allergy suffers, who need gluten free diet can replaced gluten containing cereal in their diet. 100 gram pearl millet are provided 378 kcal energy, protein 11 percent, Carbohydrate 73 per cent, fat 4 percent, Several vitamin B, minerals such as calcium 8 mg, iron 3 mg, magnesium 114 mg and some other nutrients like selenium 2.7 micro gram (USDA).

MATERIALS AND METHODS

Ten germplasm of Pearl millet were collected from different districts of Uttar Pradesh namely Balrampur, Sultanpur, Faizabad, Jaunpur, Gazipur, Bahraich and Lakhimpur were used as experimental materials. Samples of Pearl millets were brought to Biochemistry laboratory of Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad (U.P.) after collection. They were analyzed for various physical and biochemical parameters. The collected Pearl millet was cleaned, dried and dried seed was then crushed by a pestle and mortar. Finally, the product was the desired Pearl millet powder. The chemical properties of the Pearl millet powder were analyzed and the results are summarized. The milling per cent of Pearl millet grain include the dehusking and determining by traditional method using wooden pestle and mortar determining hand operated wooden pestle mortar steel persist. One hundred gram Pearl millet germplasm were weight on balance and their husk was remove with hand operated okhali finally the husk and kernel weight were recorded and there ratio was calculated.1000 grains of Pearl millet were randomly selected from threshed crop of each plot and their weight recorded on balance to obtain test weight of

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 1097-1099 (2017)

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

AMINO ACID ANALYSIS OF MAIZE (*ZEA MAYS*) BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Shilpa Singh, M.K. Shrivastava, R.N. Kewat, Ankita Sagar and Chetna Gangwar

Department of Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad 224229 (U.P.) India

**E-mail : mkfzd73@gmail.com,*

ABSTRACT

The present study was conducted in the section of Germplasm Evaluation Division at the National Bureau of Plant Genetic Resources, New Delhi. Together with wheat and rice, maize is one of the three most important crops in the world. One of the reasons maize is a staple food across the world is its high nutritional value, with high levels of starch and also valuable proteins and oils. However, maize is naturally almost deficient in lysine and tryptophan, which are two of eight amino acids regarded as essential for humans, so it needs to be part of a balanced diet. Various maize genotypes were studied for amino acid profile like by using High Performance Liquid Chromatography. The results of this study indicated that the Glutamic acid was found in the range of 19.74 to 23.57(g/16 g.N) which is highest while Tryptophan found lowest 0.77 to 1.05 (g/16 g.N) almost negligible. The study also reveals the presence of other important amino acids. These findings will help to develop improved maize having an answer to better nutrition.

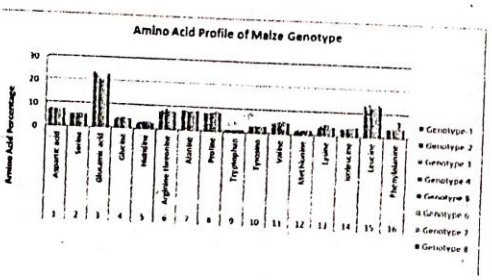
Key words : *Maize. Glutamic acid. Tryptophan. Leucine. HPLC*

Maize (*Zea mays*) is the only species usually included in the genus Zea, of the tribe Maydeae of the family Poaceae. Maize is a type of cereal grain and first adopted and cultivated by the Latin American countries. Maize is the third most important crop after wheat and rice in the world. It is used directly as food for human consumption and as feed for animals. Its importance arises both because of its great productivity and grown over an extremely wide environmental range. A robust, monoecious annual grass though generally tall, varies in height from 0.43m to sometimes over 6m in different varieties and regional types. The lower leaves being like broad flags, 50-100cm long and 5-10cm wide. The stems are erect, conventionally 2-3m in height, with many nodes. Maize kernel like the kernels of the other cereals consists of three main parts, namely hull or bran coat, embryo or germ and starchy endosperm. Maize constitutes an important source of carbohydrates, protein, vitamin B & B_{12} and minerals. It is an excellent source of carbohydrate and is complete in nutrients compared to other cereals. The average protein content of maize is about 10 percent; about half of the protein consists of zein, which is especially low in lysine and tryptophan amino acids (Douswell *et al.*, 1996). Maize protein is unbalanced with respect to its content of essential amino acid, rich in leucine and low in lysine, tryptophan and methionine. Furthermore maize oil contains a high level of polyunsaturated fatty acids and natural antioxidant (Okoruwa, 1996).

Maize is used in more ways than any other cereal for human consumption, as a food grain, a fodder crop and for hundreds of industrial purposes. Its grain, stalk, leaves, cobs, tassel and silks all have commercial value in some settings. In industrialized countries larger proportion of the grain is used as livestock feed and as industrial raw material for food and nonfood uses. Maize is the major source of starch and starch-based industrial products in many parts of the world. Grain alcohol from maize is traditionally the source of bourbon whiskey. Stigmas from female cornflowers, known popularly as corn silk, are sold as herbal supplements. Maize oil may be used with linseed oil as a paint material. With the advent of biotechnology, it has been suggested that maize hybrids will be developed for specific industrial uses by changing the chemical composition of the kernel. In view of this, the present study was undertaken to estimate total amino acids in maize especially deficient amino acids also.

MATERIALS AND METHODS

The present investigation was planned and conducted in the division of Germplasm Evaluation Division at the National Bureau of Plant Genetic Resources, New Delhi in 2008. The eight genotype of maize seeds were analyzed in the laboratory by HPLC and reported the Profile of amino acids. Weighed approx .004-.006 gm maize powder in a phial. Samples were placed in a lyophilizer to



384

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-II) : 1587-1590 (2017)

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

EFFECT OF DIFFERENT LEVELS AND SOURCES OF PHOSPHOROUS ON GROWTH, BIOCHEMICAL CHANGES AND YIELD OF WHEAT (*TRITICUM AESTIVUM* L.) UNDER SODIC SOIL

R.K. Yadav, A.K. Singh, Anand Kumar Pandey, Nitish Sharma, PradeepKumar, Chandra Pal, Prashansha Singh, R.N. Kewat

Department of Crop Physiology [1]Department of Biochemistry
Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, (U.P)-224229

ABSTRACT

The experiment was conducted in Randomized Block Design with three replications, wheat variety NW-1014. The experiment was laid out in field condition with seven treatments *viz.* T_1 (control), T_2 (60 kg SSP ha^{-1}), T_3 (60 kg DAP ha^{-1}), T_4 (80 kg SSP ha^{-1}), T_5 (80 kg DAP ha^{-1}), T_6 (100 kg SSP ha^{-1}), T_7 (100 DAP ha^{-1}). The different levels and sources of phosphorous were applied in field basal before sowing of seeds. Observations were recorded as germination percentage, (15 DAS after sowing) growth parameters, biochemical changes at 30, 60, 90 DAS and maturity after sowing. Yield and yield attributes traits were also recorded at harvest stage of crop. All the treatments increased the germination percentage, growth characters and biochemical changes superior over control. The maximum germination percentage was recorded with 80 kg DAP ha^{-1} over other treatments including control. Growth characters as plant height (cm) was found significantly superior, number of tillers plant^{-1}, dry matter plant^{-1}, total chlorophyll content (mg g^{-1} fresh weight), carbohydrate (mg g^{-1} dry weight) and protein content (%) in leaves were found significantly superior with basal application of 80 kg DAP ha^{-1} followed by 100 kg SSP ha^{-1} over control. Yield and yield contributing traits *viz.* length of spike (cm), number of spike plant^{-1}, grains spike^{-1}, number of grains plant^{-1}, yield (g plant^{-1}), 1000 grains weight (g), yield (q ha^{-1}) and harvest index (%) were also found statistically superior with basal application 80 kg DAP ha^{-1} followed by basal application of 100 SSP ha^{-1} over control.

Wheat (*Triticum aestivum* L.) is the important crop of India. It is consisting second position in both area and production after rice in India as well as world after china. The Northern and Western part of India has maximum area and production under wheat cultivation. Indian wheat can be classified into four type (1) Emmer wheat (*Triticum dicoccum Schub L.*), (2) Macroni wheat (*Triticum durum Desf.*) (3) Common bread wheat (*Triticum aestivum L.*) and (4) Indian dwarf wheat (*Triticum spherococcum Mihl.*). Uttar Pradesh, Madhya Pradesh, Punjab, Bihar, Rajasthan, Haryana, Maharashtra and Gujarat are major wheat growing state in our country; of these U.P occupies a first place in terms of both area and production. Wheat is one of the important cereals due to its relatively higher niacin and thiamine content. In addition, it is also rich in "gluten" which provides spongy cellular texture of bread and baked product with shrinking of arable land due to urbanization and industrialization, the wheat cultivation is also being pushed to marginal lands including salt affected soil.

Sodic soil is widespread in the world and in India. It occurs mainly in Indo-Gangetic alluvial plains, where it is estimated to cover about 2.8 mha. In India, salt affected soils are spread 7.0 mha. of which, 1.29 exists in U.P. alone (Abrol and Bhumbla 1971). However, information on salt affected area in India indicates for 13.0 mha (Yadav and Gupta, 1984). Salt affected soils contain excessive concentration of chloride and sulphate of sodium, calcium and magnesium (Saline soil) or excess of exchangeable sodium (alkaline or sodic soil) along with carbonate and bicarbonate. These affected soils are extensively distributed in arid and semi arid parts of Haryana, Punjab, Uttar Pradesh, Rajasthan, Gujrat, and Maharastra. The soil affected soil in U. P. are spread over several districts including Sultanpur, Raibarreilly, Azamgarh, Etawah, Pratapgarh, Ballia, Mau, Mainpuri, Hardol, Kanpur, Faizabad, Jaunpurand Fatehpur (Singh and Tyagi 1980).

The detrimental effect of sodicity on biomass production is attributed to osmotic as well as toxic effect of the ions on the physiological and biochemical function of the cells. The increasing level of soil sodicity resulted reduction in plant growth, tiller production, root and shoot (Dargan *et al.*, 1976). Soil sodicity has been found to deforess protein synthesis and accelerate its degradation in plants. In general, the level of reducing sugar and starch decreased in chloroplast, while those of non reducing sugar increased under saline condition. Salinity reduced growth and productivity in crop species due to excessive amount of salts, especially sodium cloride in the soil. Sodium cloride induces osmotic and ionic effects, leading to changes in plant metabolism (Qadir *et al.*, 2008) and reduced plant growth and development in many crop science (Sing *et al.*, 2007).

...griculture Biochemistry
...DUAT, Kumarganj.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 117-122

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 117-122
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation of Quality Parameters at Ripening Stage in New Tomato (*Lycopersicon esculentum* Mill.) Germplasms

Brijesh Kumar*, Pratibha Singh, R. P. Singh*, R. N. Kewat and Ramesh P. Singh

Department of Agril. Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad- 224 229, (U.P.), India
**Corresponding author*

ABSTRACT

The present investigation was conducted at M.E.S., Vegetable Science and analysis was carried out in the Laboratory of Department of Agricultural Biochemistry, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during Rabi season 2016-17. Ten germplasms of tomato namely NDTH-90, NDTH-101, NDTH-108, Kalyanpur Selection-2, Kalyanpur Selection-3, Kalyanpur Selection-6, IIVR Selection-2, CO-3, Arka vikas and Pusa Early Dwarf were analysed at ripening stage. Tomato germplasms with successive ripening stages were grown in Completely Randomized Design with three replications. In respect of tomato fruit have been collected separately and analysed for physical and biochemical parameters. The physical parameters namely, fruit size, fruit weight, colour and specific gravity were determined whereas, biochemical parameter were explored for the determined of lycopene, β carotene, total chlorophyll, chlorophyll a, chlorophyll b, ascorbic acid, total mineral, total free amino acid, total acidity and activity of enzyme, polyphenol oxidase and peroxidase. The data obtained in the experiment showed the highest fruit size length and diameter (4.83, 7.17 cm),at ripening stage was found in variety Pusa Early Dwarf & Arka vikas. Maximum fruit weight (95.33g.) and specific gravity (1.28 ml/cc) at ripening stage in variety CO-3 & Pusa Early Dwarf. Whereas Maximum ascorbic acid (27.67 mg/100)at ripening stage was found in variety NDTH-101and total mineral (0.80 mg/100g)at ripening stage was found in variety Arka vikas. Total acidity (0.50 %) at ripening stage was found in variety Pusa Early Dwarf. Maximum lycopene (4.93 mg/100g) at ripening stage was found in germplasms Kalyanpur Selection-6 and β carotene (1.50 mg/100g) at ripening stage was found maximum in germplasms Kalyanpur Selection-3. Whereas, total chlorophyll (1.77 mg/100g) at ripening stage was found maximum in germplasms NDTH-90 chlorophyll a& b (1.27, 0.58 mg/100g) at ripening stage was found maximum in variety/germplasms NDTH-108 &Pusa Early Dwarf. Whereas, polyphenol oxidase (35.87 unit/mg) and peroxidase enzyme (1.80 unit/mg) were found maximum in variety /germplasms Arka vikas & NDTH-108 at ripening stage.

Keywords
Fruit size, weight, specific gravity, colour, lycopene, beta -carotene, chlorophyll a, b, ascorbic acid, total mineral content, titrable acidity content and Polyphenol oxidase, Peroxidase content

Introduction

The tomato (*Lycopersicon esculentum* Mill.) is one of the most widely consumed and most popular fresh vegetable in the industrialized world. Tomato belongs to the family Solanaceae having diploid chromosome number (2n=24). It is the world's largest vegetable crop after potato and sweet potato but it tops the list of canned vegetables. It is an important condiment in most diets and a very cheap source of vitamins and antioxidents. It also contains a large quantity of water and,

The Pharma Innovation Journal 2021; 10(12): 2929-2931

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(12): 1295-1297
© 2021 TPI
www.thepharmajournal.com
Received: 02-10-2021
Accepted: 11-11-2021

Abhishek Singh
M.D., Student, Department of Agriculture Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. Pratibha Singh
Professor and Head Department of Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. Ramesh Pratap
Assistant Professor, Department of Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Dr. NA Khan
Associate Professor, Department of Biotechnology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Abhishek Singh
M.D., Student, Department of Agriculture Biochemistry, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

To determine Aloin A & B content in *Aloe vera* (*Aloe barbadensis* Miller) leaf gels

Abhishek Singh, Dr. Pratibha Singh, Dr. Ramesh Pratap Singh and Dr. NA Khan

Abstract
The present investigation was conducted at Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya during the year 2018-19 and 2019-20. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect. The experiment revealed that Aloin A maximum in IC-112532 (0.87 ppm) and minimum in IC-112512 (0.80 ppm) and Aloin B maximum in IC- 112512 (1.27 ppm) and minimum in IC-283610 (1.17 ppm).

Keywords: Aloin, *Barbadensis*, anthraquinones

Introduction
Aloe vera is a cactus-like plant that grows in hot, arid climates and is currently grown in large quantities due to strong demand. It is regarded as an all-purpose herbal plant with a high rating throughout recorded history. The thick, tapering, spiky leaves of aloe grow from a short stem near the ground. It's not a cactus, but rather a Liliaceae tree called *Aloe Barbadensis* (Ghazanfar, 1994) [1]. Among the 75 potentially active constituents in *Aloe vera* are vitamins, enzymes, minerals, carbohydrates, lignin, saponins, salicylic acids, and amino acids (Richard, 2005) [8]. The vascular layer of *Aloe vera* plants contains two major liquid materials: first, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves and containing a high concentration of anthraquinone compounds; and second, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves within the vascular layer and containing a high concentration of anthraquinone compounds, which has been used throughout the centuries as a cathartic and for medicinal purges; and, second, the inner central zone's thin-walled tubular cells form a translucent mucilaginous gel (parenchyma) that has been used since past to treat burns and other wounds, where it's thought to extend the speed of healing and reduce the risk of infection (Joseph & Raj, 2010) [6]. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect (IARC, 2016) [4]. Except within the pharmaceutical industries, the aloe plant was first used commercially in the manufacturing of "aloin", a latex substance (a yellow sap). In the food industry, it's the potential to be used as a food preservative (substitute of sulphur dioxide in preserving fruit and vegetables). Because of its anti-oxidant characteristics, it's becoming more popular as a natural covering. The leaf powder is employed during a number of ayurvedic medicines because it contains antioxidants, dietary fibre, iron, etc. Many researchers have tried to figure out what active ingredients are present in *Aloe vera* gel (Habeeb *et al.*, 2007) [2]. Proteins, lipids, amino acids, vitamins, enzymes, inorganic substances, and various carbohydrates are contained in polysaccharides located within the inner leaf parenchymatous tissue or pulp, (Hamman *et al.*, 2008) [3]. When the leaves are removed from the basal portion of the mother plant, the sap starts draining out immediately products made from *Aloe vera* plants such as gel, aloin, etc. (Pandey *et al.*, 2016) [7].

Materials and Methods
Aloin A & B content was estimated by the method of thin layer chromatography (TLC) is given by Izmailov and Shraiber (1938) [3].

Crystallization/drying
To carry out thin layer chromatography pre coated silica gel plates spectrophotometer is used

The Pharma Innovation Journal 2021; 10(12): 2929-2931
www.ThePharmaJournal.com

To determine Aloin A & B content in *Aloe vera* (*Aloe barbadensis* Miller) leaf gels

Abhishek Singh, Dr. Pratibha Singh, Dr. Ramesh Pratap Singh and Dr. NA Khan

Abstract
The present investigation was conducted at Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya during the year 2018-19 and 2019-20. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect. The experiment revealed that Aloin A maximum in IC-112532 (0.87 ppm) and minimum in IC-112512 (0.80 ppm) and Aloin B maximum in IC- 112512 (1.27 ppm) and minimum in IC-283610 (1.17 ppm).

Keywords: Aloin, *Barbadensis*, anthraquinones

Introduction

Aloe vera is a cactus-like plant that grows in hot, arid climates and is currently grown in large quantities due to strong demand. It is regarded as an all-purpose herbal plant with a high rating throughout recorded history. The thick, tapering, spiky leaves of aloe grow from a short stem near the ground. It's not a cactus, but rather a Liliaceae tree called *Aloe Barbadensis* (Ghazanfar, 1994) [1]. Among the 75 potentially active constituents in *Aloe vera* are vitamins, enzymes, minerals, carbohydrates, lignin, saponins, salicylic acids, and amino acids (Richard, 2005) [8]. The vascular layer of *Aloe vera* plants contains two major liquid materials: first, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves and containing a high concentration of anthraquinone compounds; and second, a bitter yellow latex located beneath the strongly cutinized epidermis of the leaves within the vascular layer and containing a high concentration of anthraquinone compounds, which has been used throughout the centuries as a cathartic and for medicinal purges; and, second, the inner central zone's thin-walled tubular cells form a translucent mucilaginous gel (parenchyma) that has been used since past to treat burns and other wounds, where it's thought to extend the speed of healing and reduce the risk of infection (Joseph & Raj, 2010) [6]. Aloin, an anthraquinones molecule found in the bitter yellow sap of the middle leaf layer, has a strong laxative effect (IARC, 2016) [4]. Except within the pharmaceutical industries, the aloe plant was first used commercially in the manufacturing of "aloin", a latex substance (a yellow sap). In the food industry, it's the potential to be used as a food preservative (substitute of sulphur dioxide in preserving fruit and vegetables). Because of its anti-oxidant characteristics, it's becoming more popular as a natural covering. The leaf powder is employed during a number of ayurvedic medicines because it contains antioxidants, dietary fibre, iron, etc. Many researchers have tried to figure out what active ingredients are present in *Aloe vera* gel (Habeeb *et al.*, 2007) [2]. Proteins, lipids, amino acids, vitamins, enzymes, inorganic substances, and various carbohydrates are contained in polysaccharides located within the inner leaf parenchymatous tissue or pulp, (Hamman *et al.*, 2008) [3]. When the leaves are removed from the basal portion of the mother plant, the sap starts draining out immediately products made from *Aloe vera* plants such as gel, aloin, etc. (Pandey *et al.*, 2016) [7].

Materials and Methods

Aloin A & B content was estimated by the method of thin layer chromatography (TLC) is given by Izmailov and Shraiber (1938) [5].

Crystallization/drying

To carry out thin layer chromatography pre coated silica gel plates spectrophotometer is used

Corresponding Author
Abhishek Singh
M.D., Student, Department of Agriculture Biochemistry, ANDUAT, Kumarganj.

(33)

Journal of Pharmacognosy and Phytochemistry 2018; SP2: 05-09

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 05-09

Anil Kumar
Department of Biochemistry
N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pratibha Singh
Department of Biochemistry
N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Mahesh Singh
School of Agriculture, ITM University, Gwalior, M.P, India

Correspondence
Anil Kumar
Department of Biochemistry
N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India.

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018)

Assessment of physicochemical properties of minor fruits (aonla, bael, ber, jackfruit and kaitha)

Anil Kumar, Pratibha Singh and Mahesh Singh

Abstract
Physicochemical and nutritive evaluation of five minor fruit germplasms/varieties i.e Aonla (NA_6 and NA_7), Bael (NB_5 and NB_9), Ber (Karaka and Umran), Jackfruit (NJ_2 and NJ_3) and Kaitha (K_1 and K_2) resulted a slight variation within two varieties of each fruit pertaining to size of fruit, peel/shell per cent and pulp per cent. Specific gravity was higher in Ber-U (Ber- Umran) (0.99%) followed by Ber- K (Ber-Karaka), K_1, K_2 and NA_7 (0.98%). Minimum specific gravity was recorded in NJ_2 (0.46%). Biochemical investigation of minor fruits, resulted a slight variation within two germplasms/varieties of each fruit pertaining to total mineral content, protein content and crude fibre. Total mineral content was higher in NB_5 (1.73 g/100g) followed by NB9 (1.71 g/100g) and minimum total mineral content were noticed in K_1.Protein and crude fibre was maximum in K_2 (6.92 g/100g) and NB_5 (6.38 g/100g). Lowest protein and crude fibre content were found in NA_6 (0.53 g/100g) and NA_7 (1.20 g/100g).On the whole germplasms/varieties Aonla (NA_6 and NA_7), Bael (NB_5 and NB_9), Ber (Karaka and Umran), Jackfruit (NJ_2 and NJ_3) and Kaitha (K_1 and K_2) were found best in terms of qualitative as well as physicochemical and nutritive evaluation.

Keywords: Minor fruits, size of fruit, peel/shell, pulp, specific gravity, total mineral, protein and crude fibre.

Introduction
India is the second largest producer of fruits in the world nearly covers 6.36 million hectares of area with a total production of over 88.82 million metric tonnes with productivity of 13.97 tonnes/ha. In Uttar Pradesh it is grown on 0.46 million hectares with production of 8.54 million metric tonnes, under fruit crops ranks first in terms of area, but production-wise it ranks third (Horticultural Statistics at a Glance, 2015-16) [9].
There are several fruits taken by human as its nutritional importance but several fruits are present in nature which are also nutritionally important and superior in quality but are rarely used by human because people are not aware of its nutritional importance, these fruits are known as minor fruits *viz*., Ber, Bael, Aonla, Kaitha, Jackfruit, Karonda, Imli etc. The around 72 to 73 per cent Baelpulp could be extracted, fruit weight ranged from 455 to 2010 g. The fruit colour varied from greenish to yellowish with yellow colour pulp. The average specific gravity and sphericity was 0.97 and 0.96 respectively (Kenghe and Potdar 2009) [12]. All ber varieties differed significantly on the basis of their physical analysis. Foladi was observed as one of the superior variety in terms of fruit size (13.29 cm2), fruit weight (36.99 g), stone size (2.09 cm2) and stone weight (2.31 g). However, maximum flesh ratio (10.59%) was in Gorh variety. Gorh was superior in terms of vitamin-C (176.45 mg/100g), protein (3.13%) and TSS (24.01%). The highest reducing sugars (5.64%) were observed in Khobani. Dehli White excelled in nonreducing sugars (6.12%) (Abbas *et al.* 2012) [1]. Fresh aonla fruits of cv. Chakaiya had fruit length (3.27 cm), fruit diameter (4.00 cm), fruit weight (37.27 g), pulp weight (33.11 g) and seed weight (4.16 g). Moisture, TSS, total sugars, reducing sugars, acidity, ascorbic acid, pectin, tannin, crude fibre, pH and browning were recorded as 86.50 per cent, 10.10 per cent, 8.53 per cent, 5.14 per cent, 1.85 per cent, 662 mg/100g, 1.93 per cent, 2.93 per cent, 3.07 per cent, 2.90 and 0.063, respectively (Daisy and Singh 2007) [4]. Physicochemical analysis of wood apple (Kaitha) revealed that the average fruit weight ranged from 140.08 to 256.65 g, fruit length and width from 6.50 to 8.40 cm and 6.16 to 7.43 cm respectively, specific gravity from 1.04 to 1.74, and pulp weight from 60.33 to 176.00 g, Total soluble solids ranged from 12.45 to 14.67^0 Brix, ascorbic acid from 4.87 to 6.26 mg (per

Article AR2223 DOI: HTTPS://DOI.ORG/10.23910/1.2021.2223

International Journal of Bio-resource and Stress Management

June 2021

Print ISSN 0976-3988
Online ISSN 0976-4038

IJBSM 2021, 12(3):216-221

Research Article Natural Resource Management

Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors

A. D. Gupta*, Ashish Gupta, P. K. Mishra, Yashi Gupta and R. K. Mehta

Dept. of Mechanical Engineering, Acharya Narendra Deve University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh (224 229), India

Open Access

Corresponding Author

A. D. Gupta

e-mail: ct40964p@gmail.com

Citation: Gupta et al., 2021. Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors. International Journal of Bio-resource and Stress Management 2021, 12(3), 216-221. HTTPS://DOI.ORG/10.23910/1.2021.2223.

Copyright: © 2021 Gupta et al. This is an open access article that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

Conflict of interests: The authors have declared that no conflict of interest exists.

Abstract

This research investigation was undertaken in ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India to study the numerical optimization of natural convection heat suppression in a solar flat plate collector with straight fins. Optimal characteristics of an array of thin fins attached on the absorber plat were obtained by Particle Swarm Optimization algorithm (PSOA). Free convection considered dominant in the cavity. Governing equations contained continuity; momentum and energy are discretized by finite volume method. The medium is considered incompressible, whose free convection is dominant and Boussinesq approximation is applied. A simplified model of real systems is applied with free convection. Free convection problem is solved by SIMPLER algorithm. Two confined cavities with aspect ratios 30 and 60 are considered as flat plate solar collectors. The results indicate that significant reduction on the free convection heat loss can be obtained from solar flat plate collector by using plate fins, and an optimal plate fins configuration exit for minimal natural convection heat loss for a given range of Rayleigh number. Reduction of up to a maximum of 25% at 0 inclination angle was observed in aspect ratio 30. Results showed PSOA is able to obtain characteristics of attached adiabatic fins on the absorber plate also it can obtain optimal inclination angle of cavity to decrease heat losses from solar collectors. The results obtained provide a novel approach for improving design of flat plate solar collectors for optimal performance.

Keywords: Particle swarm optimization algorithm, solar collectors, natural convection

1. Introduction

Flat plate solar collectors are technique to utilizing solar energy. The flat plate absorbs incoming solar radiation and converts it in to heat and also transfers this heat to a fluid flow. Glazing cover plate prevents from heat loss by force convection but when temperature difference between flat plate and glazing cover plate exceeds to a critical value, natural convection will exist between absorber and cover plate. In present work of heat loss from absorber plate is reduced by investigating optimal characteristics of an array of thin fins are considered. Grossman et al. (1977) expanded a model for heat transfer in a flat plate solar collector with a rectangular channel for water or air fluid flow. The analysis was performed for temperature and heat flow distributions in both dimensions of the collector to investigate the thermal boundary layer development. Overall efficiencies are calculated for uniform solar

Article History
RECEIVED on 29th March 2021 RECEIVED in revised form on 29th May 2021 ACCEPTED in final form on 22nd June 2021

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁞⁞ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9415

A COMPARATIVE ANALYSIS OF PRESSURE AND SPEED ON VOLUMETRIC EFFICIENCY AND DISCHARGE OF THE RECIPROCATING PUMP

Dr. Rajat Kumar Mehta[1], Dr. Harish Chandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar Nagar, Uttar Pradesh, India[6]

Abstract: The experiment conducted at Mahamaya College of Agricultural Engineering & Technology, Ambedkar Nagar (U.P.). The pump tested for analysis performance is ELGIMACE model no. LLO3022 single acting reciprocating pump equipped with 2 HP three phase induction electric motor with 1440 rpm. A hose measuring of water source of 4.12x3.25x1.23. G.I.20 mm size, suction pipe was used. The delivery pipe was high density pliable reinforced rubber pipe to withstand abundant pressure (up to 25 kg/cm^2). Stop watch was measuring discharge of 1/100 sec. of leastcount. For three different speeds of 242 rpm, 285 rpm and 344 rpm with five dissimilar pressures are 1.5 kg/ cm^2, 5.7 kg/cm^2, 10.3 kg/cm^2, 15 kg/cm^2 and 24 kg/cm, pump was tested. Track record of all pipe pressure used for this testing was measured by a pressure gauge having adequacy 0-35 kg/cm. In motor shaft a V(twin) belt the electric connection was energized and a pulley with minimum diameter 6.25 cm was fitted. The outcomes based on the exploratory observation showed that the efficiency rises when pressure is rises. At speed of 344 rpm the efficiency is detected 90% and at dupe speed the volumetric efficiency is 77% for least pressure 1.5 kg/cm and volumetric efficiency is 95% for maximum pressure 24 kg/cm^2. The discharge increases as pressure goes up and it is showed by the average discharge and pressure, which is almost linear. The relationship sequence is mostly same for all above circumstances; this stated that discharge is mutual to the pressure for a reciprocating pump.

Index Terms: Discharge, Efficiency, Volumetric efficiency, Pressure, rpm, Static head, Reciprocal and Pressure head.

I. INTRODUCTION

Reciprocating pump is a pneumatic machine which gets converted in hydraulic energy from mechanical energy. A cylinder containing a reciprocating piston absorbs liquid which expend a thrust (impel) force on the liquid and hike its hydraulic energy (pressure energy of liquid). It's a kind of positive displacement pump which comprises of piston or plunger. It is used at a place where relatively small amount of water is to be delivered at high pressure. Water in cylinder is displaced by the movement of piston for the functioning of reciprocating pump. Valves control the flow. A piston or plunger is cylindrical piece which moves backward and forward inside hollow cylinder. Reciprocating pump's capacity depend on the sizes of cylinder chamber, piston length and piston stroke. Electric motor engine operate a pump which have to come into prominence in a large lift irrigation schemes, high output levels can be quickly attained and managed by this process. Reciprocating pump generates high head, but their capacity is smaller compared to other types of pump. Reciprocating pump works on single acting independent suction and discharge strokes works on double acting suction and they discharge in both the direction. Although, recommendation of specific purpose pumps is very tough due to the inaccurate figures about scientific information such as efficiency discharge, head relation and other characteristics. Understanding all this circumstances, under laboratory conditions a study was approached for evaluation of volumetric efficiency, pressure discharge relationship and speed-power-discharge.

©IARJSET This work is licensed under a Creative Commons Attribution 4.0 International License

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ∷ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9435

A REGRESSION ANALYSIS MODEL FOR ESTABLISHING CORRELATION BETWEEN RAINFALL AND GROUND WATERLEVEL FLUCTUATIONS WITH RESPECT TO APPLICATION ASPECTS

Dr. Rajat Kumar Mehta[1], Dr. Harish Chandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar Nagar, Uttar Pradesh, India[6]

Abstract: The study was made in order to establish correlation between rainfall and ground water fluctuation of Ambedkar Nagar District in Uttar Pradesh through regression analysis. To study the trend in ground water level in eastern U.P. Ambedkar Nagar a model was fitted known as regression model with data for every year from 2008-2017 .The developed model equation is $Y' = -3.59 \times 10^{-3}X + 13.767810$ .The coefficient of correlation between water table and rainfall was observed as − 0.5735. The result of study had been evaluated through r^2, RMSE and EC were found to be -0.574, 1.23 & 96.6% respectively. The above empirical equation may be useful in prediction of water table depth from rainfall for base line for boring of tube well for timely irrigation of crop.

Index Terms: Rainfall, Regression Analysis, Correlation, Groundwater, Fluctuation.

I. INTRODUCTION

In 1959-60 the area underground water irrigation which is less than six million hectare but went up to 18 million hectare in 1980-81 to 33 million hectares in 1999-2000. More than half of the total irrigation is based on ground water, the share of ground water in area increasing from 30% in 1960-61 to 58.77% in 1999-2000. The area underground water is increasing progressively because it the most reliable and cost effective source of irrigation (Joshi, 2002).

The rainfall contributes to the annual increment in the ground water reserve which in turn is reflected in the rise of water table during the post monsoon period. Estimation of water table is needed for planning and developing the resources. With increasing demand for water for both agricultural and industrial use, the need to develop ground water resources to maximum possible extent has gained importance. The main component of recharge of ground water is precipitation. The ground level is an indicator of ground water availability. Ground water is an important resource of irrigation of India. It contributes to enhance agricultural production was better realize during green revolution and miss management has result in several problem likes fluctuation in water table and increasing in depth of will. In last 10 year out of total monitoring wells 60% showed depletion in water table depth during per monsoon dry session. This leads to associated problem off lowering tube well depth and drying of open dug wells in the areas. Few areas with associated problem of lowering tube well depth and drying of open dug wells has becomes the major issues. This also indicates the decreasing trend of ground water table depth over a period of time. The fluctuation of water table is mainly depending upon the precipitation received in the area. Being insufficient annual rainfall and which is not sufficient to crop production, it is become essential to have the use of ground water. For irrigation purpose the ground water is utilized through tube well, pumping etc. For installation of the tube well is necessary to know the base the depth of table.

The present investigation entitled to "develop the model for the prediction and relationship between rainfall and ground water fluctuation of Ambedkar Nagar District" was carried out with objective to establish correlation between rainfall and ground water fluctuation.

© IARJSET This work is licensed under a Creative Commons Attribution 4.0 International License

Development and Evaluation of a Tractor Operated Cotton Header

by
Pramod Kumar Mishra
Research Associate
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana-141004, India
pramod.btag@gmail.com

Manjeet Singh
Sr. Research Engineer cum Head
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana-141004, India
manjeetsingh_03@rediffmail.com

G. S. Manes
Associate Professor, Sr. Research Engineer
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana-141004, India
dermander@pau.edu

Biswa Mandal
General Manager
R&D Applitrack, Mahindra & Mahindra,
Mohali, Punjab, India
biswa.mandal@schaeffler.com

Bharat Patel
PhD scholar,
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana, Punjab, India
bharat-coaelpm@pau.edu

H. S. Brar
Assistant Agronomist,
Regional Research Station,
Punjab Agricultural University,
Bathinda, Punjab, India
hsbrar@pau.edu

Abstract

In India, cotton is mostly picked manually. Though, commercially available cotton harvesters were tried for Indian varieties, their high initial cost and their higher capacity made their use uneconomical for small or medium-size farms. Keeping in mind the conditions of Indian farms, a tractor operated cotton header has been developed. The developed machine was evaluated on RCH-773 and F-2383 cotton varieties. The forward speed significantly affected the picking capacity of both varieties i.e. RCH-773 and F-2383. Maximum picking capacity was 1865.01 and 559.50 kg/h, found at FL2, FS1, A1 and S2 combination for both varieties respectively. There was a significant effect of finger spacing observed on picking efficiency, ground loss and stalk loss for both varieties. The maximum picking efficiency was 95.56 and 94.89%, found at FL1, FS1, A2 and S1 combination for both varieties, respectively. The optimum combination of machine was found with 700 mm finger length (FL1), 16 mm finger spacing (FS1), 15 degree finger angle (A2) and 4.5 km/h forward speed (S2).

Keywords: Cotton header, cotton harvesting, picking efficiency, finger length, ground loss

Introduction

Cotton fabric alone accounts for half of the fiber worn in the world. The world demand for all fibers is expected to rise, in volume terms, from 74 million tons in 2010 to 95 million tons in 2020 (Barik, 2010). Cotton is an important commercial crop of India, having a cultivated area of 11.7 M ha, the largest in the world. Though, India is the largest producer of cotton in the world, but the yield is much less as compared to the average yield of the world. The average yield of cotton in the world is 766 kg ha^{-1}. Australia has the highest average yield of cotton as 2151 kg ha^{-1} while the average yield of cotton in India is only 540 kg ha^{-1} (Anon, 2014).

In the world, approximately 30% of seed cotton harvesting is done by mechanical harvesters. In some countries like USA, Australia and Israel, nearly 100% seed cotton is picked by mechanical harvesters. In terms of percentage, a significant amount of

International Journal of Professional Development
Vol.8,No.1,Jan-June 2019 ISSN: 2277-517X (Print), 2279-0659 (Online)
Impact Factor: 2.118(IFSIJ)

SIMULATION MODELLING OF SOLAR DRYING SYSTEM

Arun Kumar
Scientist, CCS Haryana Agricultural University, Hisar
Y.K. Yadav
Scientist, CCS Haryana Agricultural University, Hisar
Mukesh Kumar
Scientist, CCS Haryana Agricultural University, Hisar
Kapil
Corresponding author and freelance Agricultural Engineer
Email:singlakapil1981@rediffmail.com
Pramod Kumar Mishra[1]
Assistant Professor, MCAE&T, NDUAT, UP

Abstract
The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry at various operating conditions. Commercialization of any drying technology for agro processing or industrial use needs thorough performance prediction and evaluation of system in techno-economic perspectives.
Estimation of solar radiation at Hisar with the help of ASHRAE model has been in close agreement with the observed values taking 5% as level of significance. Thus the model can safely be used to predict isolation at Hisar. The calculated efficiency of the flat plate solar collector using the data at different point in the solar dryer during testing has been consistent.

Introduction

Drying is one of the essential unit operation performed to increase the shelf life of agricultural / horticultural produce and it is one of the most practical methods of preserving food and the quality of horticultural produce. Use of proper drying techniques can significantly reduce the post-harvest losses of fruits and vegetables (Atikan and Alam, 2018). There exist many technical problems associated with open sun drying namely cloudiness and rain, insect infestation, high level of dirt and atmospheric pollution and intrusions from animals and men. In addition to this there is no control on the drying process (VijayaVenkata Raman et al., 2012). Hence, developing countries, receiving significant amount of solar radiation must realise the importance of controlled drying using solar energy. Traditional method for fruits and vegetables drying in rural areas in India is to spread the products on the ground with exposure to the sun in the open air. Sun-drying method may be efficient and cheap process but has disadvantages such as contamination by dirt, insects and bacteria and loss due to wetting by rain squirrels (Esper and Muhlbauer, 1998). These are usually accepted as an inherent part of the method of processing. In order to protect the products from above mentioned disadvantages and also to accelerate the time for drying the products, control the final moisture and reduce wastage through bacterial action. Solar energy is fast becoming an alternative source of energy because of the high rate of depletion of the conventional energy sources. It has many advantages over other alternative source of energy such as wind because of its abundant, inexhaustible, renewable and non-polluting nature. Equally, it can be tapped at a relatively low cost. The associated danger of fire or other hazards are less (Ekechukwu and Norton, 1999).

Whereas, controlled solar drying system leads to faster rate of drying and exposure of products against rain, dust, storm, birds, rodents, insects and pests are avoided. This ensures better quality of dried products which would fetch higher prices (Hossain and Bala, 2007). In solar drying method, faster drying takes place which result a significant reduction in drying time. Product dried in solar dryer are superior in quality (colour and flavour). Though the same superior quality product can be obtained by using electricity or electric power, but the electric operations are expensive and are not within the reach of our rural and tribal population. There is also inadequate supply of electricity in rural areas. In such conditions solar-energy crop dryers appear increasingly to be attractive as commercial propositions (Das and Kumar, 1989).

The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry

Computer Aided Design and Development of a Tractor Operated Cotton Header

by
Pramod Kumar Mishra
Research Associate
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana-141004, INDIA
pramod.btag@gmail.com

Manjeet Singh
Sr. Research Engineer cum Head
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana-141004, INDIA
manjeetsingh_03@rediffmail.com

Biswa Mandal
General Manager,
R&D Applitrack, Mahindra & Mahindra,
Mohali, Punjab, INDIA
biswa.mandal@schaeffler.com

Derminder Singh
Professor
Dept. of Electrical Engineering &
Information Technology,
Punjab Agricultural University,
Ludhiana, Punjab, INDIA
derminder@pau.edu

Vishal Bector
Associate Professor
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana, Punjab, INDIA
vishalbector@pau.edu

Bharat Patel
PhD scholar,
Dept. of Farm Machinery and Power Engineering,
Punjab Agricultural University,
Ludhiana, Punjab, INDIA
bharat-coaefpm@pau.edu

Abstract

Cotton is an important commercial crop of India, having 12.81 M ha cultivated area that is the largest in the World. In India 100% of the cotton is harvested manually. Cotton can be harvested mechanically by commercially available cotton pickers (the most commonly used) or cotton strippers, which remove all the cotton bolls. A conceptual design of 3 row finger type cotton header was done by keeping in view the harvesting of local cotton varieties and agronomic practices. Based upon review, important design and operational parameters such as finger type cotton header such as finger length, finger spacing, finger angle and forward speed were selected for the study. All the sub-assemblies like header frame, finger, reel, auger and power transmission were created using NX-8 CAD software at Mahindra Applitrac, Mohali. Based upon 2D drawings and bill of material (BOM), a tractor operated three row cotton header was developed and fabricated. The location of center of gravity of the developed machine was 186 mm nearer from the rear axle (longitudinal) than the normal tractor, 123 mm offset from the left side of rear axle (lateral) instead of at the center as for normal tractor and 400 mm above than the normal tractor from the ground (height).

Keywords: Cotton header, CAD, Cotton stripper, 3D modeling, Center of gravity

Introduction

It is estimated that the world requirement for all fibres is expected to rise from 74 million tonnes in 2010 to 95 million tonnes in 2020. Current split of various fibers namely cotton, cellulosics, jute and other natural fibers, wool and synthetics is 40.0, 50.0, 5.0 and 2.0 and 3.0 %, respectively (Barik, 2010). Cotton is an important commercial crop of India, having approximate 12.81 million ha cultivated area that is the largest in the world. Although, India is the largest producer of cotton in the world yet its yield is much less as compared to the world average yield. The average yield of cotton is only 540 kg/ha as compared to 2151 kg/ha in Australia as against the

Efficacy of the prototype electrostatic nozzle for cotton crops

B. Patel[1], M. Singh[2], P.K. Mishra[3*], G.S. Manes[2] & M.K. Patel[4]

[1]*Department of Farm Machinery and Power Engineering, Chaudhary Charan Singh Haryana Agricultural University, Hisar, India*
[2]*Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India*
[3]*Department of Farm Machinery and Power Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, India*
[4]*Council of Scientific and Industrial Research, Central Scientific Instruments Organisation, Chandigarh, India*

A prototype of an electrostatic nozzle was developed for spraying cotton crops in a project titled 'Design and development of an electrostatic nozzle for agricultural applications'. The study was carried out to evaluate the locally-developed electrostatic nozzle and compare its performance with an imported electrostatic nozzle and solid cone nozzle (conventional knapsack sprayer) in the cotton crop at the departmental research farm of Punjab Agricultural University, Ludhiana, India. Different spray performance parameters, *i.e.* number median diameter (NMD), volume median diameter (VMD), uniformity coefficient, droplet density, the volume of spray deposition, and area covered with droplets were determined with the help of water-sensitive paper (WSP) method of deposition collection. There was comparatively less variation in uniformity coefficient with the imported and locally-developed electrostatic nozzles than the solid cone nozzle at a 5 % level of significance. The average droplet density obtained with both the imported and locally-developed electrostatic nozzles was significantly more compared to the solid cone nozzle. The area covered by the droplets of the locally-developed prototype of the electrostatic nozzle was more than the solid cone nozzle. The volume of spray deposition differed significantly for all three treatments at a 5 % level of significance. Overall, there was no significant difference in the performance of both electrostatic sprayers, but they were found to be more effective than the solid cone nozzle.

Key words: electrostatic nozzle, uniformity coefficient, droplet density, volume of spray deposition.

INTRODUCTION

Cotton is one of the most important textile fibres in the world, accounting for about 35 % of the total worldwide fibre usage. It is the single most cash crop that is cultivated extensively throughout the world. India, China and the United States of America are the major cotton-producing countries and together account for approximately two-thirds of total world cotton production (Anon 2015a). India is the largest cotton-producing country in terms of total production with an average of 6.10 Mt per year on a total sown area of 11.8 Mha. However, it has the 33rd ranking in the world in terms of yield per hectare because of a low average yield of about 517 kg/ha as compared to the world's average of about 566.27 kg/ha (Anon. 2015b).

Although cotton production and yield increased by introducing new crop varieties and production practices, still significant yield loss was observed as 4.1, 6.5, and 8.8 % in the cotton crop in three districts of India, namely Firozpur, Mansa, and Bathinda, respectively (Dhawan *et al.* 2008). Crop loss due to different insects has been reported to run to 18.0 to 50.0 % (Dhaliwal *et al.* 2010). In an another study the range of yield loss due to cotton leaf curl virus disease was reported to be from 81.4 to 88.4 % in all northern cotton-growing states of India (Monga 2014, as cited in Kumar Sain *et al.* 2019)

There are several spraying methods to protect crops from pests and diseases. Based on the volume application rate, there are three types of sprayers: high volume sprayer, low volume sprayer, and ultra-low volume sprayer. The high volume sprayer leads to loss of spray due to the larger size of droplets and more liquid application

*Author for correspondence. E-mail: pramod.bhaj@gmail.com

Received 5 November 2020. Accepted 30 August 2021

ISSN 1021-3589 [Print]; 2224-8854 [Online]
DOI: https://doi.org/10.4001/003.029.0471

©Entomological Society of Southern Africa

Vol. 14(4), pp. 24-31, 15 March, 2019
DOI: 10.5897/SRE2016.6411
Article Number: BE06F8560496
ISSN 1992-2248
Copyright©2019
Author(s) retain the copyright of this article
http://www.academicjournals.org/SRE

ACADEMIC JOURNALS
Scientific Research and Essays

Full Length Research Paper

Precision attributes based index for the selection of efficient agricultural machinery

Manjeet Singh[1], Karun Sharma[2*], Pramod Mishra[1], Bharat Patel[1] and S K Singh[1]

[1]Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India.
[2]Krishi Vigyan Kendra, Samrala, Punjab Agricultural University, Ludhiana, India.

Received 5 May, 2016; Accepted 25 January, 2017

Development and introduction of high capacity, precise, reliable and energy efficient machinery/equipment is the need for judicious use of inputs. Manufacturing of agricultural machinery in India is varied in nature and starts from village artisans, tiny units, cottage to small scale industries, organized tractor and agricultural machinery manufacturers including energy and processing machinery industry. Precision in application rates for higher input-use efficiency can be achieved only by improving the designs of the existing machinery/equipment. Precision index (PI) of machine/equipment is based on its capability to perform a given task in an accurate manner. It is a worthwhile attribute to compare the performance of different equipment and operations to enhance the productivity of a given farm. The purpose of study was to propose an index, that is, PI to select efficient and precise machine/equipment for the farmers. PI values were calculated for three types of machinery namely zero seed cum fertilizer drills, planters and spraying machines. It was concluded that drill Make 2, tested in the year 2004, was having the highest PI value, that is, 0.87 or 87% followed by drill Make 1 having PI value 0.86 or 86% tested in the same year. Drill Make 5 tested in the year 2013 was having minimum PI value, that is, 0.80 or 80%. PI value for happy seeder machine was 0.88 or 88%. During the testing of multi-crop planter in year 2014, the variability of doubling attribute was more, that is, 28% followed by missing having 20% value and produced influence on PI which was observed to be 0.83 or 83%. PI of semi-automatic and automatic potato planter was found to be 0.70 and 0.80, respectively. The value was not much satisfactory and could be ranked under average category. PI of electrostatic sprayer mounted with single as well as twin nozzle was observed to be the highest, that is, 0.89 followed by PI of air assisted sprayer with single and double nozzle, that is, 0.83 and 0.84, respectively.

Key words: Precision index, zero till seed cum fertilizer drill, happy seeder, spraying machines, planting machines.

INTRODUCTION

Mechanization imparts capacity to the farmers to carry out farm operations, with ease and lesser drudgery. It helps the farmers to achieve timeliness, precisely meter and apply costly input with better efficacy and efficiency. Efficient machinery helps in increasing productivity by about 30% (Kulkarni, 2012) besides enabling the farmers

*Corresponding author. E-mail: karunluckysharma@gmail.com.

Author(s) agree that this article remain permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

Int.J.Curr.Microbiol.App.Sci (2020) *9*(10): 1379-1387

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 10 (2020)**
Journal homepage: http://www.ijcmas.com

Review Article https://doi.org/10.20546/ijcmas.2020.910.165

Advances in Sugarcane Peeling Mechanisation

S. K. Pandey[1*], P. K. Mishra[1] and S. K. Pandey[2]

[1]Mahamaya college of Agricultural Engineering and Technology, Ambedkar Nagar-224122, (ANDUAT, Kumarganj, Ayodhya), India
[2]College of Agriculture, Kotwa, Azamgarh, 276001 (ANDUAT, Kumarganj, Ayodhya), India

**Corresponding author*

Keywords

Sugarcane peeling machine, Peeling, Sugarcane, Mechanisation, Peeling efficiency

Article Info

Accepted:
12 September 2020
Available Online:
10 October 2020

A B S T R A C T

Sugarcane is multipurpose crop that serves as source of sugar, juices, jaggery and various products for man and raw materials for industry. But prior to the process of machining process, some processing is required to remove the solid particles, spots and sludge on the cane. The processing of sugarcane strip for industrial or human use involves different operations of which peeling is a major one and cannot be neglected. Of all the unit operations involved in cane processing, several processes have been mechanized successfully. This study presents the features, prospects, performance evaluations and limitations of some sugarcane peeling machines in world like the fixed outer drum peeler, automated cane peeler, knife-edge type self-fed peeler, etc. Their peculiar advantages and operational parameters such as machine speed, output capacity, peeling efficiency and cane losses were evaluated. Aside from the manual ones, the ranges of the peeling efficiency and cane loss were recoded in range of 59.9 – 91.4 % and 2–4% respectively. As machine speed increased, the output capacity and cane loss increased while peeling efficiency decreased. Mechanization of this peeling process has the potential of encouraging growth in cultivation, cane utilization and improving the product quality of value-added products. The product quality, processing efficiency, minimum loss of cane and increased processing rate will be affected by improved sugarcane peeling process.

Introduction

The sugar cane family is made up of over 30 sugar cane varieties. Sugar cane is a perennial grass that thrives in hot, humid locations like Brazil and India. The sugar derived from sugar cane is used in syrups, juices, and molasses, but the rest of the plant can also be used in the production of environmentally friendly paper products.

The juice from the sugar cane's stalk is highly prized and is the source of 70% of the world's sugar. It also has the highest number of calories per unit area of any plant. Fresh sugarcane juice is a popular beverage in many countries particularly in Asian region such as China, India, Malaysia and Thailand due to its taste and cheap price. Flavonoids that can be found in sugarcane juice have the abilities to protect cells from degenerative processes and to reduce the development of health problems

RESEARCH PAPER | International Journal of Agricultural Engineering | Volume 12 | Issue 2 | October, 2019 | 199-202
ISSN-0974-2662 ■ Visit us : www.researchjournal.co.in ■ DOI: 10.15740/HAS/IJAE/12.2/199-202

Performance evaluation of mahua stamen remover

■ S. K. Pandey, V. Choubey, P. K. Mishra and S. Pandey

Received : 25.07.2019; Revised : 19.08.2019; Accepted : 05.09.2019

See end of the Paper for authors' affiliation

Correspondence to :

S. K. Pandey
Department of Agricultural Engineering, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) India
Email : sushil.pandey999@gmail.com

■ **ABSTRACT :** Mahua stamen remover was evaluated for its performance. It was tested at four moisture levels (11.9, 13.17, 15.64 and 17.66 % d.b.) and three feed rates (15, 21, 27 kg/h). The stamen removal efficiency and whole flower recovery were determined to optimize feed rate and moisture content of mahua flower for better performance of the machine. The present study revealed that the optimum flower moisture content and feed rate were found to be 13.17 per cent and 15 kg/h, respectively with stamen removal efficiency of 88.23 per cent and whole flower recovery of 81.2 per cent.

■ **KEY WORDS :** Mahua stamen remover, Stamen removing efficiency, Whole flower recovery ans deseeder

■ **HOW TO CITE THIS PAPER :** Pandey, S.K., Choubey, V., Mishra, P.K. and Pandey, S. (2019). Performance evaluation of mahua stamen remover. *Internat. J. Agric. Engg.*, **12**(2) : 199-202, **DOI: 10.15740/HAS/IJAE/12.2/199-202.** Copyright@2019: Hind Agri-Horticultural Society.

Mahua *(Madhuca indica)* of Sapotaceae family is a large tree found inthe deciduous forest of India. Every part of the mahua tree is used by the tribals for their livelihood. Its flower is used as foods and can be fermented to alcoholic drinks due to its high sugar content. It is a multipurpose tree providing food, fuel, timber, green manure, oil, oil cake, liquor and raw materials for several products and is one of the most important trees of Indian forest. It also has a religious and a high bio-esthetic value in the tribal culture. It is one of those multipurpose forest tree species that provide an answer for the three major Fs *i.e.,* food, fodder and fuel (Banerji and Mitra, 1996). It is very important from the point of view that it can help inpromoting nutritional and economic security in backward areas.

The estimated annual production of mahua flower is around 2 lakh tonnes (*www. jhamfcofed.com*) in Jharkhand. Mahua tree produces edible flowers and fruits. The ripe flowers, which fall from the tree, are collected. The yield per tree ranges from 100-200 kg. Mahua is also famous for its seed oil.

Mahua flower can be utilized in a variety of ways in home, as animal feed and also as raw material for industrial products. They can be used as a sweetener inpreparation of many local dishes like *Halwa, Kheer, Puri* and *Burfi* (Patel and Naik, 2008). It is also used for preparation of bakery and confectionary goods. Tribal people also use it for brewing alcohol. It contains tannin as tannins are excellent antioxidant that helps in giving the structure, texture and flavour to wine. Mahua flowers are also considered good for cooling and are used as a tonic and demulcent. However, an estimated 90 per cent of the production goes into brewing beverages. Mahua has various types of medicinal uses due to its tannin content. It is used as anti-diabetic, antiulcer, hepato protective, anti-pyretic, anti-fertility, analgesic, anti-oxidant, swelling, inflammation, piles, emetic, dermatological, laxative, tonic, anti-burn, anti-earth worm, wound healing headache and many more problems (Patel *et al.,* 2012). On account of various advantages of mahua

Plant Archives Vol. 19 No. 1, 2019 pp. 1358-1362 e-ISSN:2581-6063 (online), ISSN:0972-5210

ENERGY INPUT FOR FODDER CROP PRODUCTIONS UNDER DIFFERENT TYPES OF FARMING SYSTEMS

Pramod Kumar Mishra*, Sunny Sharma, Himanshu Tripathi and Dharmendra Pandey

Lovely Professional University, Phagwara, Punjab, India

Abstract

The pattern of energy utilize in cultivation of fodder crop was studied under traditional and partially mechanized farming system. It was observed that the total operational energy was found to be 6883.83 MJ/ha and 7298.73 MJ/ha in traditional and partially mechanized farming system respectively. Out of which 48.52 and 56.21 percent was utilized by direct source of energy in different farming systems, whereas 51.48 and 43.79 percent was utilized by indirect sources of energy. The total energy cost in traditional farming system was Rs 86450 /ha. Similarly, the cost of energy in partially mechanized system was Rs 93201 /ha. This difference clearly indicates that traditional farming system can be replaced by partially mechanized farming system with more return.

Key word: Partially mechanized farming system Energy ratio, energy productivity etc.

Introduction

Energy is integral part to national development process and to provide major vital services that improve human requirements; fuel for cooking, light for living, motive power for transport, and electricity for modern communication. In agricultural sector, its use is in every form of inputs., seed, fertilizer, agro-chemical for plant protection, machinery use for various operation, housing, transport, and processing. Apart from solar energy, production agriculture uses basic additional energy inputs., soil, water, tractive power, chemicals for growth of plants. The amount of energy invested through these inputs and quantity actually used by the plant govern the crop growth and yield during their life cycle.

Singh *et al.* 202 has estimated that total energy input Indian agriculture increased by 3.6 times. In modern agriculture, commercial energy sources (fuel, machinery and chemicals) contribute bulk of the energy supplies to the production system. Commercial energy use in agriculture has been increasing since revolution with increasing use of diesel and electricity in farm operations. The share of agriculture in electricity consumption has increased from 3.9% of the total consumption in 1950-51 to 29.6% in 1993-94. Total commercial energy use in agriculture increased nearly fivefold with growth rate of 11.8% between 1980-81 to 1994-95. The share of agriculture in total consumption in the country increasing marginally from 3.2 to 5.2% during the same period. Increase in land productivity and efficient diversification of agriculture for better economic return to the producers will call for significantly higher level of input to agriculture (Mahapatra, 1991).

India is presently under heavy stress on account of a large-scale exploitation for fuel wood, timber and fodder, mismanagement of forest resources and frequent fires. There is acute shortage of fodder especially green nutritious fodder, which is major cause of low productivity of livestock, especially in hilly area (Deb Roy *et al.*, 1989). The main reasons for low productivity is insufficient and low quality fodder and feed including grazing facilities (Deb Roy, 1993). Therefore, India has been the home of major draught, milch and dual-purpose breeds of cattle. Indian dairy production system is complex and generally based on traditional and socioeconomic considerations. However, there has been a rapid change in way of agriculture (*i.e.* cropping system, water resources, diversification of crops, intensification of agriculture), increasing use of mechanical power, transformation from

*Author for correspondence :

The Pharma Innovation Journal 2021; 10(8): 1139-1142

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(8): 1139-1142
© 2021 TPI
www.thepharmajournal.com
Received: 09-05-2021
Accepted: 13-06-2021

Manish Kumar Maurya
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SN Rahul
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VP Dubey
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Kumar Yadav
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SP Vishwakarma
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shyam Babu Gautam
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Manish Kumar Maurya
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

In vitro efficacy test of fungicides against *Ustilaginoidea virens* causing false smut of rice

Manish Kumar Maurya, SK Singh, SN Rahul, VP Dubey, Vikash Kumar Yadav, SP Vishwakarma and Shyam Babu Gautam

Abstract
Rice false smut caused by *Ustilaginoidea virens* (Cke.) Tak. is an emerging threat now a days. It causes both qualitative and quantitative yield losses. The present study is carried out to evaluate the efficacy of five fungicides against *Ustilaginoidea virens*. The result revealed that the complete inhibition was observed under treatment Propineb, Propiconazole, Carbendazim 63% + Mancozeb 12% and Tebuconazole 50% + Trifloxystrobin 25% while in Kresoxim methyl, inhibition per cent is 57.69 and 69.98 at concentration 0.1% and 0.2% respectively in *in vitro* condition.

Keywords: Rice, false smut, fungicides, *in vitro*, *U. virens*

Introduction
False smut disease caused by *Ustilaginoidea virens* (Cke.) Tak. (teleomorph form: *Villosiclava virens*) is a destructive disease of rice all around the world. The disease was first reported from Tirunelveli district of Tamil Nadu staffe of India (Cooke, 1878) [4]. False smut was recognized as a symbol of a more yield and due to its sporadic occurrence, it is considered as a minor disease. It is also known as Lakshmi (goddess of wealth and prosperity) disease. Now a day, it has become a main constraint in a rice production in many rice growing regions of India (Ladhalakshmi *et al*., 2018) [8] due to use of high input (large application of nitrogenous fertilizer) large scale use of hybrid varieties and climate change (Rani *et al*., 2015) [12]. The False smut pathogen (*U. virens*) infect the plant during flowering stage where an individual healthy grains converts firstly into whitish, yellowish orange to green velvety spores which later turns into greenish black in colour (Baite *et al*., 2014) [1].

False smut causes a qualitative and quantitative loss and in northern Indian states, disease incidence (per cent of infected tillers) varied from 2 to 75 per cent. In Uttar Pradesh, a yield loss was recorded up to 5-85 per cent (Singh *et al*., 2014) [13]. Over all, the loss in yield due to false smut disease in India has been varied between 0.2–49%, depending on disease incidence and rice varieties (Dodan and Singh, 1996) [3]. Various researchers reported different effective fungicide from time to time, carbendazim (Hegde *et al*., 2000) [6], trifloxystrobin + tebuconazole and propiconazole (Ladhalakshmi *et al*., 2014), Kresoxim methyl, Tebuconazole and Azoxystrobin + Difenconazole (Banasode and Hosagoudar, 2020) [2], Copper oxychloride and copper hydroxide, Hexaconazole (Bhargava *et al*., 2018) [5]. Therefore, present investigations were conducted to know the appropriate and effective combination group of fungicides to inhibit the pathogen *in vitro*.

Materials and Methods
The experiments were conducted in the laboratory of Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP.

Isolation of pathogen
False smut infected panicles were collected from the NSP-6 farm of the university. The smut balls was brought to the laboratory and isolates them on a PDA (Potato Dextrose Agar) medium as described by Ladhalakshmi *et al*., 2012 [8]. The smut balls were thoroughly washed repeatedly in tap water. Surface sterilized in a mercuric chloride (1% $NaOCl_2$) solution for 30 seconds followed by three times rinsing in sterilized distilled water. The false smut balls were cut into two halves, the inner layer containing spores was then streaked on PSA medium which was supplemented with 100ppm streptomycin to avoid bacterial contamination. The inoculated Petri-plates were incubated in a BOD incubator at 25+1 ^{0}C.

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 4184-4192

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 4184-4192
Journal homepage: http://www.ijcmas.com

Original Research Article

Antagonistic Potential of Locally Isolated *Trichoderma spp.* on Different Species of *Fusarium*

Vikash Pal Singh[1], Laxman Prasad[2], Kamal Khilari[1] and Siddarth N. Rahul[3]*

[1]SVP University of Ag. and Tech., Modipuram, Meerut – 250110, India
[2]Department of Plant Pathology, IARI, New Delhi, India
[3]ANDUA & T, Kumarganj, Ayodhya – 224229, India
Corresponding author

A B S T R A C T

In the present investigation twenty locally isolated microorganisms including nineteen *Trichoderma spp.* and one *Penicillium spp.* were tested for their antagonistic property against three different species of the *Fusarium viz. Fusarium oxysporum* f. sp. *Lycopersici, Fusarium oxysporum* f. sp. *Cicero, Fusarium fujikuroii.* Antagonistic activities results showed that Tharz-6, Tviri-1, Thama-1, and Tviri-5, Tpoly -2 were suppressed higher mycelia growth of *F. o.* f. sp. *ciceri* at 48 hrs and Tharz-1 and Tpoly-1 were superior inhibitor of mycelia growth of pathogen at 96 hrs, time interval. Likewise, Thama-1 and Tpoly-2 were suppressed higher growth of *F. o.* f. sp. *lycopersici* at 48 hrs and Tpoly-1 and Thama-1 were superior inhibitor of mycelia growth of this pathogen at 96 hrs. It indicates the Tpoly and Thama were effective at every time interval. Though, the antagonistic activity of Tharz-2, Tviri-1, Tvire-2 and Tharz-6 were suppressed higher mycelia growth of *F. fujikuroii* at 48 hrs and Tharz-1, Tpoly-1, Tviri-4, and Tvire-2 were superior inhibitor of mycelia growth of this pathogen at 96 hrs, its indicates the Tharz and Tviri were effective at every time interval.

Keywords:
Trichoderma spp., Fusarium spp. and Bio-control

Introduction

Soil borne plant pathogens are the major problem among the disease causing agents. *Fusarium spp.* are the one of most important soil borne fungal pathogen of plants it causes economic loss to more than 200 host plants.

The *Fusarium spp.* used in the present investigation are soil borne which caused wilt and rot in various crop (Chakraborty, 2005 and Chakraborty and Chatterjee 2008). Therefore, it is for reach to control by chemical or fungicides as soil and seed application. The alternative approach, for the control these pathogens is the use of bio-agents. Though, the biocontrol agent is necessary to control effectively of such soil borne plant pathogens.

In the present communication, an attempt was made to study the antagonistic activity of these fungal antagonist of *Trichoderma spp* and *Penicillium spp.* against soil borne pathogen *fusarium spp* which caused wilt and rot in various crop.

Scenarios of biological control of soil-borne plant pathogens using most encouraging bio-control agent, the genus *Trichoderma* has

Annals of Phytomedicine 10(2): 515-520, 2021

DOI: http://dx.doi.org/10.21276/ap.2021.10.2.68

Annals of Phytomedicine: An International Journal

http://www.akaazpublications.com/publication/index.php

Print ISSN : 2278-9839 Online ISSN : 2393-9885

Original Article : Open Access

Inhibitory effect of botanicals and bioagents against *Ustilaginoidea virens* (Cooke) Takah. causing false smut of rice

Manish Kumar Maurya*, S.K. Singh, Vikash Kumar Yadav, S.N. Rahul and S.P. Vishwakarma

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229, U.P., India

Article Info

Article history

Received 28 June 2021

Revised 14 August 2021

Accepted 16 August 2021

Published Online 30 December 2021

Keywords

Rice

False smut

Botanicals

Bioagents

Ustilaginoidea virens (Cooke) Takah.

Abstract

Ustilaginoidea virens (Cooke) Takah. causing false smut of rice is a destructive disease which causes an economic yield loss ranges from 0.2-49%. The present study is carried out to check inhibitory effect of botanicals and bioagents against *U. virens*. Among botanicals, neem oil at both concentration, i.e., 5 per cent and 10 per cent was found highly effective and inhibit the growth by 66.97% and 70.14%, respectively followed by onion (62.89%, 67.64%), garlic (58.82%, 64.25%), ginger (55.88%, 63.57%) and tulsi (46.40%, 54.98%). Among bioagents, maximum inhibition (53.55%) was observed in *Bacillus subtilis* followed by *Pseudomonas fluorescence* (41.87%), *Trichoderma viride* (40.35%) and *Trichoderma harzianum* (36.29%) in *in vitro* condition.

1. Introduction

Rice (*Oryza sativa* L.) being the most staple cereal food crop, grown in India, providing one third of calories requirement for more than 70 per cent of Indian population. More than 90 per cent of world's rice is grown and consumed in Asia, known as rice bowl of the world. To focus attention on the importance of rice in global food security and necessity into increased rice production and productivity, United Nation General Assembly in 2002, declared to celebrate the year 2004 as "International year of rice.

In India, it is cultivated in an area of 43.77 Mha with a production of 169.14 Mt and has an average productivity 3.86 t/ha (Anonymous, 2019). The major rice producing states are West Bengal, Punjab, Uttar Pradesh, Andhra Pradesh, Bihar and Tamil Nadu. In Uttar Pradesh, it is cultivated in an area of 5.81 Mha with production of 19.91 Mt and average productivity 3.42 t/ha (Anonymous, 2019).

Rice crop is affected by number of biotic and abiotic factors. Among biotic factors, diseases caused by fungi, bacteria, virus and others are the major one. False smut is one of the most calamitous fungal diseases of rice and its occurrence is reported from every corner of the world wherever rice is growing (Ladhalakshmi *et al.*, 2018). Initially, the disease was of minor importance and commonly known as "Welcome/Lakshmi disease" because the disease was considered as an indicator of vigorous crop resulting into good harvest but due to continuous use of high dose of nitrogenous fertilizer extensively, cultivation of hybrid cultivars and climatic change, the disease becomes major one (Jehan *et al.*, 2019). The disease was first reported from Tirunelveli district of Tamil Nadu state of India (Cooke, 1878). The false smut pathogen *U. virens* infect the plant during flowering stage where an individual healthy grain converts firstly into whitish, yellowish orange to green velvety spores which later turns into greenish black in colour (Biate *et al.*, 2014).

In Uttar Pradesh, a yield loss was recorded ranges from 5-85 per cent (Singh *et al.*, 2014). Continuous use of fungicides has resulted in accumulation of toxic compounds which is hazardous to humans, animals and environment and also build-up resistance in the pathogens. So, botanicals and bioagents are the best alternative and economical way to manage the disease. Management of diseases and pests by the use of plant-based products was practiced over time until synthetic pesticides were developed (Mahmood *et al.*, 2016). Various researchers reported different effective botanicals from time-to-time. Neem and garlic was found effective as reported by Mahmud *et al.* (2017). Different bioagents are normally dominant components of the soil microflora in extensively varying habitats and are very effective against the *U. virens* (Xiaoli.e *et al.*, 2011; Kannahi *et al.*, 2016; Nath and Das, 2020). Therefore, the present investigation was carried out to know the appropriate and effective botanicals and bioagents against *U. virens in vitro*.

2. Materials and Methods

The experiments were conducted in the laboratory of Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P. during 2020-21.

2.1 Isolation of pathogen

Panicles infected with false smut were collected from the NSP-6 farm of the University. The smut balls were brought to the laboratory

Corresponding author: Mr. Manish Kumar Maurya

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India

E-mail: mkmaurya@gmail.com

Tel.: +91-8574867592

Copyright © 2021 Ukaaz Publications. All rights reserved.

Email: ukaaz@yahoo.com; Website: www.ukaazpublications.com

Annals of Phytomedicine 10(2): 502-506, 2021

DOE: http://dx.doi.org/10.21276/ap.2021.10.2.66

Annals of Phytomedicine: An International Journal

http://www.ukaazpublications.com/publications/index.php

Print ISSN : 2278-9839 Online ISSN : 2393-9885

Original Article : Open Access

Effect of botanicals on collar rot of chickpea caused by *Sclerotium rolfsii* Sacc. in combination with *Trichoderma harzianum*

Suraj Kumar Patel, Siddarth N. Rahul* and Sushil Kumar Singh

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh India

Article Info

Article history
Received 9 October 2021
Revised 29 November 2021
Accepted 30 November 2021
Published Online 30 December 2021

Keywords
Botanicals
Trichoderma harzianum
Sclerotium rolfsii Sacc.
collar rot

Abstract

In this study, the effect of different botanicals in combination with *Trichoderma harzianum* were used to observe plants mortality and yield affected by collar rot of chickpea. The effect of different treatments on germination at 20 days after sowing and vigour index I (germination × plant height), vigour index 2 (germination × dry weight), 45, 60, 75 days after sowing (DAS) and also yield parameter like (yield per plot and yield in q/h) were evaluated at after harvesting of chickpea. Significant variant in germination of chickpea seeds were recorded under different treatments. The lowest germination was recorded in the control plot (T9) (85.89%) and maximum in (T8) with (97.33%) at 20 days after sowing. Highest vigour index 1 (2019.59) and vigour index 2 (147.94) were recorded in T8, maximum plant height in T8 (20.75, 25.25, 33.38 cm.), highest total number of branches per plant in T8 (5.47, 6.27, 7.67), maximum fresh weight in T8 (6.42, 17.50, 20.72 gm.), maximum dry weight in T8 (1.52, 4.26, 5.09), minimum plant mortality in T8 (3.55, 7.47, 14%) and maximum plant mortality in control (9.73, 15.07, 21%) were recorded at 45, 60, 75 DAS, and maximum yield per plot in T8 (1.68 kg) and also the yield parameter and plants mortality was best observed in T8 followed by in botanical T2 (Neem oil 2.5%) with combination of *Trichoderma harzianum*, respectively.

1. Introduction

Chickpea (*Cicer arietinum* L.) is, a self-pollinated, diploid (2n = 2x = 16) annual legume of family Fabaceae and known as various names, viz., Gram, Bengal gram, Garbanzo and Egyption pea. It was first cultivated in south eastern region of the world, but now it is also cultivated in semi-arid regions (Agarwal *et al.*, 2012). Pulses contain higher proportions of protein (17%-30% by dry weight) in comparison to other plant foods. With the protein, chickpea is a good source of carbohydrates has comparison to other pulses, according to Wallace *et al.* (2016). There are various biotic and abiotic factors that affect the production of the chickpea in the world as well as in India too. The biotic factor includes insect pests and a number of devastating diseases caused by fungi, bacteria, viruses, and nematodes. The fungal diseases such as fusarium wilt (*Fusarium oxysporum* f.sp. *ciceris*), Ascochyta blight (*Ascochyta rabiei*), collar rot (*Sclerotium rolfsii*), Verticillium wilt (*Verticillium dahliae*), black root rot (*Fusarium solani*), Phytophthora root rot (*Phytophthora megasperma*) and seed rot (*Aspergillus flavus*), *etc.* Among all of the diseases collar rot disease, caused by *Sclerotium rolfsii Sacc.*, is a serious threat to chickpea that may cause 55-95% mortality of the crop at seedling stage under favourable environmental conditions (Gurha and Dubey, 1982).

Corresponding author: Dr. Siddarth N. Rahul
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh India
E-mail: sagar6499@gmail.com
Tel.: +91-8795114474

Copyright © 2021 Ukaaz Publications. All rights reserved.
Email: ukaaz@yahoo.com; Website: www.ukaazpublications.com

2. Materials and Methods

2.1 Preparation of botanicals

Fresh parts of the test plants (*Lantana camara*, *Eucalyptus* spp. *Ocimum sanctum* and *Azadirachta indica*) were collected and washed thoroughly in clean water. Hundred grams of each washed samples were grinded in mortar and pestle by adding equal amount (100 ml) of sterilized distilled water (1:1 W/V) and boiled at 80ºC for 10 min in a hot water bath. The grinded material was filtered through muslin cloth followed by filtering through sterilized Whatman No. 1 filter paper and treated as standard 100 per cent plant extract (Nene and Thapliyal, 1982) and required concentrations of five per cent of each plant extract were prepared.

2.2 Treatments details

All the treatments were used as seed treatments. (T1) Seeds treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and *Pseudomonas* spp. (10 gm/kg seed). (T2) Seeds treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and Neem oil (2.5%). (T3) Seed treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and Jeevamrit (5%). (T4) Seed treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and *Lantana camara* extract (5%). (T5) Seed treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and *Eucalyptus* spp. extract (5%). (T6) Seed treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and *Ocimum sanctum* extract (5%). (T7) Seed treated with combination of *Trichoderma harzianum* (10 gm/kg seed) and Neem leaf extract (5%). (T8) Seed treated with combination of *Trichoderma harzianum*(10 gm/kg seed) and Carbendazim (3 gm/kg seed).

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(3): 981-986
© 2019 IJCS
Received: 19-03-2019
Accepted: 21-01-2019

Prashansha Singh
NDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Vinaya Kumar Yadav
CS Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

AH Khan
NDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Ram Kalap Yadav
NDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Prashansha Singh
NDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

To study the response of salicylic acid on growth, physiological traits, yield and yield components of wheat varieties on timely and late sown conditions

Prashansha Singh, Vinaya Kumar Yadav, AH Khan and Ram Kalap Yadav

Abstract
The present investigation entitled "Effect of salicylic acid on growth, physio-chemical changes and yield of wheat (*Triticum aestivum* L.) under high temperature at anthesis" was conducted at Students Instructional Farm of the Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *rabi* seasons of 2014-15 and 2015-16. The experiment was planned under RBD (Randomized Block Design) with three replications. The treatment consisted of two date of sowing viz;25th November and 25th December with two varieties NW-5054 and NW-2036 with six salicylic acid treatment. Results indicated that growth attributes such as plant height, number of tillers per plant and dry weight per plant influenced with the date of sowing. When late sown variety was planted timely all the growth attributes showed drastic reduction with respect to late sowing (25th December). However, NW-5054 showed comparatively good performance in terms of growth attributes at timely sown (25th November). Performance of NW-5054 was very good as compared to NW-2036 due to delayed sowing on 25th December. Among SA treatments,T10(Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS) resulted in highest increase in these traits while T9 (Foliar spray of (0.75mM) salicylic acid at 30 DAS)over control. Proline content in leaves increased with the age of the crop up to 90 DAS in both the date of sowing. The highest amount of proline content was recorded at 90 DAS in both the varieties under both the date of sowing. Date of sowing influenced the membrane injury index (MII). Both the varieties had higher MII at 60 DAS. SA treatment significantly decreased the MII at all the growth stages. The activity of antioxidant enzymes viz: catalase, superoxide dismutase and peroxide in leaves increased with the age of the crop up to 90 DAS under both the date of sowing in both the varieties.SA treatments increased the activities of catalase, superoxide dismutase and peroxide enzyme. However, maximum increase in the activity of these enzymes was observed with T10 (Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS). Time of sowing decreased substantially almost in all the yield components measured viz; number of ear per plant, ear length, number of grains per plant, test weight, biological yield and harvest index which caused severe reduction in yield. Overall, T10 (Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS) treatment showed best result and T2 Seed soaking in (0.25mM) salicylic acid gave least. All the salicylic acid treatments reduced the detrimental effect of heat stress on both the varieties by improving physiological traits which ultimately helped in obtaining higher yield.

Keywords: Growth, conditions, physiological traits, yield and yields components

Introduction
Wheat (*Triticum aestivum* L.) is the most important cereal crop belongs to family poaceae. It is staple diet for more than one third of the world population. Wheat crop occupies 21.8% of the total area under food grains. It constitutes the staple food for at least 43 countries including China, India, USA, France, Russia, Canada, Australia and a member of European countries. Wheat is an important crop of India. It is grown over 26 million hectares. Wheat production in 2016-17 is forecast at 93.5 million tonnes (Source: International Grains Council (IGC).India ranks second in area (12.5%) and production (12.05%) of wheat in the world which is next to China (Anonymous, 2013)[13]. India has about 29.25 mha area with the production of 85.93mt and productivity of 29.38 q/ha. The northern and western part of India has maximum area and production under wheat cultivation. In Uttar Pradesh, area, production and productivity are 9.67 mha, 33.97 mt and 31.13q/ha, respectively Uttar Pradesh ranks first in area (36.58% of India) and production (36.27% of India) of wheat in the country.

652

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 721-726
Received: 10-05-2019
Accepted: 12-06-2019

Prashansha Singh
N. D. U. A. & T. Kumarganj, Ayodhya, Uttar Pradesh, India

Vinaya Kumar Yadav
C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

AH Khan
N. D. U. A. & T. Kumarganj, Ayodhya, Uttar Pradesh, India

Anand Kumar Pandey
N. D. U. A. & T. Kumarganj, Ayodhya, Uttar Pradesh, India

Ram Kalap Yadav
N. D. U. A. & T. Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Prashansha Singh
N. D. U. A. & T. Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of salicylic acid on growth, physio-chemical changes and yield of wheat (*Triticum aestivum* L.) under date of sowing at anthesis

Prashansha Singh, Vinaya Kumar Yadav, AH Khan, Anand Kumar Pandey and Ram Kalap Yadav

Abstract
The present investigation entitled "Effect of salicylic acid on growth, physio-chemical changes and yield of wheat (*Triticum aestivum* L.) under high temperature at anthesis" was conducted at Students Instructional Farm of the Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *rabi* seasons of 2014-15 and 2015-16. The experiment was planned under RBD (Randomized Block Design) with three replications. The treatment consisted of two date of sowing *viz*;25th November and 25th December with two varieties NW-5054 and NW-2036 with ten salicylic acid treatment *viz*; (T1)Control, (T2)Seed soaking in (0.25mM) salicylic acid, (T3)Foliar spray of (0.25mM) salicylic acid at 30 DAS, (T4)Seed soaking in (0.25mM) salicylic acid + Foliar spray of (0.25mM) salicylic acid at 30 DAS,(T5)Seed soaking in (0.50mM) salicylic acid, (T6)Foliar spray of (0.50mM) salicylic acid at 30 DAS, (T7) Seed soaking in (0.50mM) salicylic acid + Foliar spray of (0.50mM) salicylic acid at 30 DAS,(T8)Seed soaking in (0.75mM) salicylic acid, (T9)Foliar spray of (0.75mM) salicylic acid at 30 DAS, (T10)Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS. When late sown variety was planted timely all the growth attributes showed drastic reduction with respect to late sowing (25th December) whereas NW-5054 showed comparatively good performance in terms of growth attributes at both sowing dates. Performance of NW-5054 was very good as compared to NW-2036 due to delayed sowing on 25th December. Application of salicylic acid significantly increased all growth attributes in both varieties under both timely and late sown. Time of sowing decreased substantially almost on all the yield components and enzyme activity measured *viz*; number of ear per plant, ear length, number of grains per plant, test weight, biological yield, harvest index, proline content and total soluble sugar content whose caused severe reduction in yield. Overall, T10 (Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS) treatment showed best result and T2 Seed soaking in (0.25mM) salicylic acid gave least. All the salicylic acid treatments reduced the detrimental effect of heat stress in both the varieties by improving physiological traits which ultimately helped in obtaining higher yield.

Keywords: Growth, conditions, enzyme, yield and yield parameter

Introduction
Wheat (*Triticum aestivum* L.) is the most important cereal crop belongs to family poaceae. It is staple diet for more than one third of the world population. Wheat crop occupies 21.8% of the total area under food grains. It constitutes the staple food for at least 43 countries including China, India, USA, France, Russia, Canada, Australia and a member of European countries. Wheat is an important crop of India. It is grown over 26 million hectares. Wheat production in 2016-17 is forecast at 93.5 million tonnes (Source: International Grains Council (IGC) India ranks second in area (12.5%) and production (12.05%) of wheat in the world which is next to China (Anonymous. 2017) [1]. India has about 29.25 mha area with the production of 95.9 mt and productivity of 29.38 q/ha. The northern and western part of India has maximum area and production under wheat cultivation. In Uttar Pradesh, area, production and productivity is 9.67 mha, 33.97 mt and 31.13 q/ha, respectively Uttar Pradesh ranks first in area (25.58% of India) and production (36.27% of India) of wheat in the country.

There are number of constraints which affect wheat production and decrease the economic value of wheat. Among them increase in temperature due to global warming is one major factor. Most of the world crops including wheat have an optimal range of temperature. Exposure to higher than optimal temperature reduced yield and decreased quality of subject grain. Over 7 million hectares of wheat grown in approximately 30 countries are subjected to continual heat stressing environment and adversely affects wheat growth in many important production regions and is a major limitation to wheat productivity worldwide. Heat stress is a function of the magnitude and rate of temperature (Wahid *et al*., 2007) [20]. At present,

664

NAAS-5.21

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 126-130
Received: 06-01-2019
Accepted: 07-02-2019

Vishuddha Nand
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

R Yadav
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Verma
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Yadav
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Vishuddha Nand
ND University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of fertilizers and cutting schedule on growth and quality of dual purpose barley crop (*Hordeum vulgare* L.)

Vishuddha Nand, R Yadav, Rajesh Kumar, RK Doharey, SK Verma, Neeraj Yadav and RK Yadav

Abstract
A field experiment was carried out at Agronomy Research Farm,Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during Rabi season 2016-17.The experiment was laid out in Split Plot Design with three replications. Main plot were treated with fertilizer levels, F_1 (60 kg N+ 30kg P_2O_5 ha^{-1}), F_2(80 kg N+40 kg P_2O_5 ha^{-1}), F_3 (100 kg N+50 kg P_2O_5 ha^{-1}) and F_4 (120 kg N+60 kg P_2O_5 ha^{-1}) and sub plot were treated with cutting schedule as 45 DAS, 55 DAS, 65 DAS and 75 DAS. The results revealed that the growth parameters like, plant height, dry weight of plant, leaf area index (LAI) and no. of tillers at first cutting and at harvest were recorded maximum with the application of 120 kg N + 60 kg P_2O_5 ha^{-1} followed by 100 kg N + 50 kg P_2O_5 kg ha^{-1} and 80 kg N + 40 kg $P_2O_5ha^{-1}$ respectively and significantly higher over the application of 60 kg N +30 kg P_2O_5 ha^{-1}. The maximum plant height (77.28 cm) was recorded when barley crop cut as 75 DAS which was higher tune to the 12.6%, 17.57% and 32.51% over 65, 55 and 45 days after sowing. The dry matter accumulation, leaf area index and no. of tillers were also maximum in the same cutting. However, the quality parameters viz. crude protein (12.88%), crude fiber (31.87%),TDN (65.93%), WSC(10.40%), ADF (31.34%), NDF (52.49%) and Ash (13.34%) were recorded maximum with the application of 120 kg N + 60 kg P_2O_5 ha^{-1} while in case of cutting schedule the maximum crude fiber (31.49%), WSC (10.80%), ADF (33.58%), NDF (54.02%) and Ash (15.20%) were found at first cut (75 DAS) where as crude protein (13.13%) and TDN (65%) obtained at first cut (45 DAS).

Keywords: growth, LAI, fresh weight, plant height, P_2O_5 Barley and cutting schedule

Introduction

India is the largest milk producing country in the world with livestock population of 529 million and milk production 133 mt. It contributes nearly 7% in the global cereal production. Barley grain largest use as animal feed in all over the world and in India also, a major share of barley grain is used as animal feed either alone or mixture with fodder crops. Barley has tremendous potential and variation for production of very high amount of digestible dry matter as well as protein yield per hectare. It is grown successfully in a wider range of climatic conditions than any other cereals. Barley has such morpho-physiological traits that make it suitable for dual purpose cultivation for fodder and grain production than other cereals. It is highly efficient in the utilization of water and nutrients in limiting conditions. It is high capacity of crop for tillering and regenerate after cutting and additional capacity for large accumulation of biomass. It sets seed rapidly after re-growth, thus escaping terminal stress due to high temperature and warm winds often experienced in the region. Thus, as a dual purpose (green forage and feed/grain) crop it provides a welcome boost to the confidence of forage growers and fits well for crop diversification in the integrated crop-livestock farming system. Area under barley in world is 47.5 mha with 123.7 mt production and 2.68 t/ha Productivity. Russian federation holds first position in all over the world in terms of area and production with 4.94 mha and 8.35 mt respectively.

In India, barley crop was grown over an area of 695.0 thousand hectare with a production of 1743.2 thousand tones and productivity of 2.51 t ha^{-1} during 2012-13 (Anonymous, 2013) [1]. Uttar Pradesh is one of the most important barley growing states of India. In Uttar Pradesh, the area under cultivation of barley is about 168.0 thousand ha^{-1} with a production of 441.0 thousand tonnes and productivity of 2.63 t ha^{-1} (Anonymous, 2013) [1]. Dual purpose barley is an excellent alternate crop for fodder purpose. The nutritive value of green fodder is highest at 50% flowering stage and decreases after flowering stage in most of the crops. In dual purpose barley crop, stage of harvesting also determine the regenerative potential of the crop, the regeneration capacity is adversely affected by the higher stage of harvesting for green fodder.

610

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 1896-1899
© 2019 IJCS
Received: 02-11-2018
Accepted: 06-12-2018

Vinaya Kumar Yadav
Department of Crop Physiology C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Anil Kumar Singh
Department of Crop Physiology C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Prashansha Singh
Department of Crop Physiology N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Rajnish Kumar
Department of Crop Physiology C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Shubham Kumar Srivastav
Department of Crop Physiology C. S. Azad University of Agriculture & Technol gy, Kanpur, Uttar Pradesh, India

Vikas Yadav
Department of Crop Physiology C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Ram Kalap Yadav
Department of Crop Physiology, N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Vinaya Kumar Yadav
Department of Crop Physiology C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Effect on foliar application of potassium nitrate on morpho-physiological and yield potential in different wheat [*Triticum aestivum* L.] cultivars under drought and irrigated conditions

Vinaya Kumar Yadav, Anil Kumar Singh, Prashansha Singh, Rajnish Kumar, Shubham Kumar Srivastav, Vikas Yadav and Ram Kalap Yadav

Abstract
The field experiments were conducted at Student Instructional Farm of CSAUAT Kanpur, during Rabi 2016-17 and 2017-18. The objective of investigation was to study the effect of foliar applied thio-urea with different doses on plant traits (morphological, yield and its components) of two wheat varieties under drought and irrigated condition. It was designed in split-split plot design with three replications. The two conditions *i.e.*, drought (I_0) and irrigated (I_1) conditions were allocated in the main plots and two wheat varieties *i.e.*, V_1 (K-1006) and V_2 (K-307) in sub plot and for each five chemical treatments were applied as foliar spray at heading stages by 500 ppm (T_2) and 1000 ppm thio-urea (T_4), along with control (T_0) in sub-sub plots. The significantly higher grain yield (5.30 & 5.26 gm) with best morpho-physiological. Next to this were 500ppm thio-urea (T_3) *i.e.*, 5.12 & 5.08, 1000ppm thio-urea (T_4) *i.e.*, 5.08 & 5.03 as compare to control (T_0) *i.e.*, 4.39 & 4.35 gm. Among cultivars, maximum responsive was K-1006 (V_1) in most of traits and gave significantly higher grain yield (5.26 & 5.30) and and minimum in K--307 (V_2) *i.e.*, 5.08 & 5.12 gm with both concerning experimental years.

Keywords: Growth parameter, yield parameter, foliar spray on thio-urea, drought and irrigated conditions

Introduction
Wheat [*Tritium aestivum* L.] is one of the most important cereal crops of the world. Bread wheat is the major staple food source for a large part of global population. It is second most important cereal crop after maize and plays an important role in national food security. It has originated from the Levant region of the New East and Ethiopian Highlands, but now cultivated worldwide. Wheat is the world's most outstanding crop that excels all other cereals both in area and production, known as king of cereals. It is also one of the most nutritious cereals and its contribution to human diet puts it in the first rank of plants that feed the world (Costa *et al.*, 2013) [4]. Wheat consumption worldwide is estimated to 817 million tons by 2030 and production would need to increase at 22.6-43.6% in different countries at the current production level to meet the estimated consumption demand. It gives me immense pleasure to bring out the
current issue of Wheat & Barley Annual Report. I am also very delighted to share that during (Anonymous, 2017-18) [2], once again, the country has achieved a highest record wheat production of 99.70 mt which is very close to the magical figure of 100 mt from an area of 29.58 mha thereby registering an all-time high productivity of 3371 kg/ha. Similarly, in barley also the country harvested a record production of 1.77 mt from an area of 0.66 mha achieving a record average productivity of 2679 kg/ha. *Inter alia*, coordinated research, conducive environmental conditions, governments pro-farmers' policies and farmers hard work contributed towards achieving good productivity in both the crops across regions facilitating the farmers to be on the track of "Doubling the Farmers Income by 2022" as envisioned by the Hon'ble Prime Minister of India.
Drought is the most prevailing problem and the factor known to be serious for its impacts on crop limitations (Souza *et al.*, 2004) [10]. This kind of abiotic stress often occurred as consequence of the reduction of the water level that reaches earth due to extreme atmospheric

620

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(3): 916-919
© 2019 IJCS
Received: 16-03-2019
Accepted: 18-04-2019

Prashantha Singh
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Vinaya Kumar Yadav
C. S. Azad University of
Agriculture & Technology
Kanpur, Uttar Pradesh, India

Afif Khan
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Ram Kalap Yadav
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Correspondence
Prashantha Singh
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

The response of salicylic acid on growth, yield and yield components of wheat varieties on timely and late sown conditions

Prashantha Singh, Vinaya Kumar Yadav, Afif Khan and Ram Kalap Yadav

Abstract
The present investigation entitled "Effect of salicylic acid on growth, physio-chemical changes and yield of wheat (*Triticum sectivum* L.) Under high temperature at anthesis" was conducted at Students instructional Farm of the Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during rabi seasons of 2014-15 and 2015-16. The experiment was planned under RBD (Randomized Block Design) with three replications. The treatment consisted of two date of sowing viz.25th November and 25th December with two varieties WW-3054 and WW-2036 with six salicylic acid treatment viz. (T1)Control, (T2)Seed soaking in (0.25mM) salicylic acid, (T3)Foliar spray of (0.25mM) salicylic acid at 30 DAS, (T4)Seed soaking in (0.25mM) salicylic acid + Foliar spray of (0.25mM) salicylic acid at 30 DAS, (T5)Seed soaking in (0.5mM) salicylic acid, (T6)Foliar spray of (0.5mM) salicylic acid at 30 DAS, (T7) Seed soaking in (0.5mM) salicylic acid + Foliar spray of (0.5mM) salicylic acid at 30 DAS, (T8)Seed soaking in (0.75mM) salicylic acid, (T9)Foliar spray of (0.75mM) salicylic acid at 30 DAS, (T10) Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS. Results indicated that growth attributes such as plant height, number of tillers per plant and dry weight per plant influenced with the date of sowing. When late sown variety was planted timely all the growth attributes showed drastic reduction with respect to late sowing (25th December) However, WW-3054 showed comparatively good performance in terms of growth attributes at timely sown (25th November). Performance of WW-3054 was very good as compared to WW-2036 due to delayed sowing on 25th December. Application of salicylic acid significantly increased all growth attributes in both varieties under both timely and late sown. Time of sowing decreased substantially almost in all the yield components measured *viz*. number of ear per plant, ear length, number of grains per plant, test weight, biological yield and harvest index which caused severe reduction in yield. Overall, T10 (Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS) treatment showed best result and T2 Seed soaking in (0.25mM) salicylic acid gave least. Overall growth attributes physiological traits and yield as well as yield components of wheat crop were adversely affected by time of sowing due to onset of high temperature during crop growth and particularly grain filling. All the salicylic acid treatments reduced the detrimental effect of heat stress in both the varieties by improving physiological traits which ultimately helped in obtaining higher yield.

Keywords: Growth, conditions, yield and yield parameter

Introduction
In India, wheat production has been stagnant around 70-72 million tonnes since 1999-2000, to meet the increasing demand of the growing population till 2020, it is estimated that around 9 million tonnes wheat grain production will be required. It is consumed in the form of chapattis, puris, naji or rawa. Wheat grain has relatively high content of niacin and thiamine that's why wheat proteins are especially important in human diet. Beside their significance in nutrition they are principally concerned in providing the "gluten" which provides spongy cellular texture of bread and baked product. Wheat straw is good source of feed for a large population of cattle in our country.

There are number of constraints which affect wheat production and decrease the nutritive value of wheat. Among them increase in temperature due to global warming is an important factor. Most of the world crops including wheat have an optimal range of temperature. Exposure to higher than optimal temperature reduced yield and decreased quality of wheat grain. Over 7 million hectares of wheat grown in approximately 50 countries are subjected to continual heat stressing environment and adversely affects wheat growth in many important

Int.J.Curr.Microbiol.App.Sci (2019) 8(2): xx-xx NAAS-5.38

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 02 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.802.xx

Foliar Response of Chemicals on yield and yield Attributing Characters of Rice (*Oryza sativa* L.) under Rain Fed Condition

Vikas Yadav*, Mayank Pratap, A.H. Khan, R.K. Yadav and Rajneesh

Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, (Kumarganj), Faizabad-224 229 (Uttar Pradesh) India

**Corresponding author: 5200vikasyadav@gmail.com*

Keywords

Rice, Rain fed, Chemicals and yield

Article Info

Accepted:
xx January 2019
Available Online:
xx February 2019

A B S T R A C T

The present investigation entitled "Foliar Response of Chemicals on Yield and Yield Attributing Characters of rice (*Oryza sativa* L.) Under Rain fed Condition" was conducted during the *Kharif* season in 2016 at the Student Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.). Experiment was conducted in randomized block design with three replications and nine treatments on rice variety (Sahbhagidhan) under rainfed condition. Chemicals *viz*., foliar spray of 0.5 and 1.0%KCl, 1.0 and 2.0% $MgSO_4$, 0.3 and 0.6% Boric acid and 0.25 and 0.5% Salicylic acid at two growth stages(15 DAT and milky stage) along with untreated control (distilled water spray). Yield and yield attributing characters *viz*., Number of panicle bearing tiller plant^{-1}, Number of grains panicle^{-1}, Number of sterile grains panicle^{-1}, Grain yield (kg ha^{-1}), Straw yield (kg ha^{-1}) and Test weight (g)were improved by different chemical concentrations. On the basis of results obtained foliar application of various chemicals enhanced yield as compare to control under rain fed condition. The effects of 1.0 % $MgSO_4$ were more pronounced fallowed by salicylic acid 0.25 and 0.5% as well as 1% KCl over other treatments.

Introduction

Rice (*Oryza sativa* L.) as one of most important cereals worldwide is considered as the major food of more than 2 billion of peoples across the world (Akhgary, 2004). The rice is one of economically important crops in the world (Bajaj and Mohanty, 2005; Harkamal *et al*., 2007) which is cultivated in 114 countries (FAO, 2004).

Rice is staple food of a millions of people in the world particularly in developing countries. About 90 per cent of rice grown in the world is produced and consumed in Asian countries (Patel *et al*., 2016). India rank first in respect of area (44.50 million ha) second in production (102.75 million tonnes), but the productivity of rice is very low (2.20 t ha^{-1}) (Verma *et al*., 2015).

Rice has the evolutionary particularity of being semi-aquatic. The conventional system for irrigating rice is to flood, which provides water and nutrient supply under anaerobic conditions and uses large amounts of water.

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA 2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF SALICYLIC ACID AND CYCOCEL ON BIOCHEMICAL AND PHENOLOGY CHANGE OF MUSTARD (*BRASSICA JUNCEA* L. CZERN&COSS)

R. K. Yadav[1], Pradip Kumar Saini[2], Aditya Singh[1], Vinaya Kumar Yaadav[2], R.N. Kewat[1] ,Adesh Kumar[1] and S. Prasad[1]
1Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224 229 (U.P.)
2Chandrashekhar Azad University of Agriculture and Technology, Kanpur-208 002 (U.P.)

Abstract

The investigation entitled "Effect of salicylic acid and cycocel on biochemical and phenology change of mustard(*Brassica juncea* L. Czern & Coss)" was conducted during *rabi* season, 2016-17 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) in randomized block design with 7th treatments, three replications and variety Narendra rai (NDR-8501). Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm) , (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on biochemical and phenology parameters like Chlorophyll content, Oil content (%), Days to 50 % flowering. The maximum chlorophyll 'a' and 'b' content was observed in salicylic acid 200ppm followed salicylic acid 100ppm at 60 DAS and 80 DAS over the control and maximum oil content was recorded in salicylic acid 200ppm followed by salicylic acid 100ppm and lowest increase was recorded in cycocel 200ppm among all treatments & Maximum increase in number of flowers plant^{-1} was observed with the treatment of salicylic acid 200ppm followed by salicylic acid 100ppm and lowest increase was recorded in control among ten treatments.

Keyword: Biochemical, phenology, salicylic acid, cycocel

Introduction

Oilseed crops play an important role in agricultural economy of India. Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeisguineensis*Jacq.). Mustard is an important *rabi*crop of Rajasthan, Gujarat, Madhya Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Assam. India is one of the largest rapeseed-mustard growing countryin the World, occupying the first position in area and third position in production after China and Canada. India occupies the second position in area after China and third position in production of rapeseed-mustard in the world after China and Canada. In India, it is the second most important edible oilseed crop after groundnut sharing 25-30 percent Indian oilseed economy. The share of oilseeds is 14.1 % out of the total cropped area, in India, rapeseed-mustard accounts for 3% of it. Mustard seed is the second largest produced oilseed in the world with an area of 37.0 m ha, with the production of 63.09 m tones and productivity of 11.90 q ha^{-1}. India contributes 28.3 % and 19.8 % in world acreage and production. India produced around 7.4 mt of rapeseed-mustard next to China (11-12 mt) and EU (10-13 mt) with significant contribution in world rapeseed industry. Among the entire oilseed crops producing states in India, in U.P. the area under cultivation was 6.39 lakh ha with production of 7.9 lakh metric tonnes and productivity of 12.36 q ha^{-1} (Anonymous,2015).In India, mustard is mostly cultivated for use as edible oil. It is used as condiments and spices to improve the flavour of pickles and also as fodder for livestock. There is an increasing interest in crop as source of erucic acid for chemical industry. Rapeseed and mustard cake is used as a protein supplement in livestock and poultry feed. The cake has minerals like, S, P, Co, K, Mg, Zn and vitamins like niacin, thiamine, riboflavin, and vitamin E. The Indian mustard possesses oil content ranging from 31-48 per cent in air dried seeds. PGRs are extremely important agent and play an important role from germination up to senescence of the plant. Plant growth regulators (PGRs) can play an important role in increasing its yield by making the plants photosynthetically more effective. Use of growth regulators increased. Salicylic acid is ortho-hydroxyl benzoic acid and is a secondary metabolite acting as analogous of growth regulating substances. It helps in protection of nucleic acids and prevention of protein degradation. The salicylic acid is also known to induce many genes coding for parthenogenesis and proteins in response to biotic and abiotic stresses (Enyedi *et al*., 1992). Foliar application of salicylic acid increased the IAA content in broad bean leaves. Foliar application of salicylic acid exerted a significant effect on plant growth metabolism when applied at physiological concentrations, and thus acted as one of the plant growth regulating substances (Kalarani *et al*., 2001). Cycocel (2-Chloro ethyl three methyl ammonium chloride) is the most usual anionic plant growth, regulator. There are reports that anionic compounds treated plants were tolerant to drought conditions compared to untreated plants. Moreover, they had higher net photosynthesis potential. From a biochemical point of view, CCC prevents ent-kaurene synthesis in GA3 biosynthetic cycle leading to GA3 deficiency and the subsequent reduced vegetative growth reported that any yield increase by CCC was related to the enhanced dry matter accumulation. Cycocel foliar application increased cytokinin translocation from roots to shoots, leading to prolonged aboveground parts life-span and hence increased yield

Materials and Methods

The experimental site is situated at the student Instructional Farm of the university on the Ayodhya, Raibareli road, at a distance of 42 km from Faizabad city and 23 km away from Jagdishpur. In the present study, Variety Narendra rai (NDR-8501) Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm) , (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on growth parameters like Chlorophyll content, Oil content (%), Days to 50 % flowering.

Results and Discussion

Biochemical:

Chlorophyll content

The data presented in Table 1. clearly indicate that the foliar application of plant growth regulators improved the chlorophyll contents in leaf up to 60 DAS and after 60 DAS the decline trend was recorded in chlorophyll content. The maximum increase in chlorophyll content was registered in T_4 (salicylic acid @ 200ppm) at 40 DAS (2.31), 60 DAS (2.97), 80 DAS (1.98) followed by T_3(salicylic acid @ 100ppm) at 40 DAS (2.24), 60 DAS (2.88),80 DAS (1.92) and minimum increase in T_7 (cycocel @200ppm) at 40 DAS (1.95), 60 DAS (2.51), 80 DAS (1.67) and over control at 40 DAS (1.89), 60 DAS (2.43),and 80 DAS (1.62). Bekheta 2004 and Bekheta *et al*., 2006.

Table-1: Effect of salicylic acid and cycocel on chlorophyll of mustard at different growth stages

Treatments	Chlorophyll (SPAD value)		
	40 DAS	60 DAS	80 DAS
T_1 : Control	1.89	2.43	1.62
T_2 : Salicylic acid (50ppm)	2.01	2.59	1.72
T_3 : Salicylic acid (100ppm)	2.24	2.88	1.92
T_4 : Salicylic acid (200ppm)	2.31	2.97	1.98
T_5 : Cycocel (100ppm)	2.16	2.78	1.85
T_6 : Cycocel (150ppm)	2.12	2.72	1.81
T_7 : Cycocel (200ppm)	1.95	2.51	1.67
SEm±	0.05	0.06	0.04
CD at 5%	0.15	0.18	0.12

Int.J.Curr.Microbiol.App.Sci (2019) 8(2): xx-xx NAAS-5.38

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 8 Number 02 (2019)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2019.802.xx

Foliar Response of Chemicals on yield and yield Attributing Characters of Rice (*Oryza sativa* L.) under Rain Fed Condition

Vikas Yadav*, Mayank Pratap, A.H. Khan, R.K. Yadav and Rajneesh

Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, (Kumarganj), Faizabad-224 229 (Uttar Pradesh) India

**Corresponding author: 5200vikasyadav@gmail.com*

Keywords

Rice, Rain fed, Chemicals and yield

Article Info

Accepted:
xx January 2019
Available Online:
xx February 2019

A B S T R A C T

The present investigation entitled "Foliar Response of Chemicals on Yield and Yield Attributing Characters of rice (*Oryza sativa* L.) Under Rain fed Condition" was conducted during the *Kharif* season in 2016 at the Student Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.). Experiment was conducted in randomized block design with three replications and nine treatments on rice variety (Sahbhagidhan) under rainfed condition. Chemicals *viz.*, foliar spray of 0.5 and 1.0%KCl, 1.0 and 2.0% $MgSO_4$, 0.3 and 0.6% Boric acid and 0.25 and 0.5% Salicylic acid at two growth stages(15 DAT and milky stage) along with untreated control (distilled water spray). Yield and yield attributing characters *viz.*, Number of panicle bearing tiller plant^{-1}, Number of grains panicle^{-1}, Number of sterile grains panicle^{-1}, Grain yield (kg ha^{-1}), Straw yield (kg ha^{-1}) and Test weight (g)were improved by different chemical concentrations. On the basis of results obtained foliar application of various chemicals enhanced yield as compare to control under rain fed condition. The effects of 1.0 % $MgSO_4$ were more pronounced fallowed by salicylic acid 0.25 and 0.5% as well as 1% KCl over other treatments.

Introduction

Rice (*Oryza sativa* L.) as one of most important cereals worldwide is considered as the major food of more than 2 billion of peoples across the world (Akhgary, 2004). The rice is one of economically important crops in the world (Bajaj and Mohanty, 2005; Harkamal *et al.*, 2007) which is cultivated in 114 countries (FAO, 2004).

Rice is staple food of a millions of people in the world particularly in developing countries. About 90 per cent of rice grown in the world is produced and consumed in Asian countries (Patel *et al.*, 2016). India rank first in respect of area (44.50 million ha) second in production (102.75 million tonnes), but the productivity of rice is very low (2.20 t ha^{-1}) (Verma *et al.*, 2015).

Rice has the evolutionary particularity of being semi-aquatic. The conventional system for irrigating rice is to flood, which provides water and nutrient supply under anaerobic conditions and uses large amounts of water.

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

QUALITY PARAMETERS OF TOMATO (*LYCOPERSICON ESCULENTUM* MILL.) STRAINS / VARIETIES AT RIPENING STAGE GROWN IN EASTERN U. P.

Brijesh Kumar*, Pratibha Singh, R. N. Kewat, R. K. Yadav and S. K. Vishwakarma
Department of Agril. Biochemistry, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya- 224 229 (U.P.) India

Abstract

Ten germplasms of tomato namely NDTH-90, NDTH-101, NDTH-108, Kalyanpur Selection-2, Kalyanpur Selection-3, Kalyanpur Selection-6, IIVR Selection-2, CO-3, Arka vikas and Pusa Early Dwarf were analysed at ripening stage.

The data obtained in the experiment showed the highest fruit size length and diameter (4.83, 7.17 cm) at ripening stage was found in variety Pusa Early Dwarf & Arka vikas. Maximum fruit weight (95.33g.) and specific gravity (1.28 ml/cc) at ripening stage in variety CO-3 & Pusa Early Dwarf .Whereas maximum ascorbic acid (27.67 mg/100) at ripening stage was found in variety NDTH-101 and total mineral (0.80 mg/100g) at ripening stage was found in variety Arka vikas. Total acidity (0.50 %) at ripening stage was found in variety Pusa Early Dwarf. Maximum lycopene (4.93 mg/100g) at ripening stage was found in germplasms Kalyanpur Selection-6 and β carotene (1.50 mg/100g) at ripening stage was found maximum in germplasms Kalyanpur Selection-3. Whereas, total chlorophyll (1.77 mg/100g)at ripening stage was found maximum in germplasms NDTH-90 chlorophyll a & b (1.27, 0.58 mg/100g) at ripening stage was found maximum in variety/germplasms NDTH-108 & Pusa Early Dwarf .Whereas Polyphenol oxidase (35.87 unit/mg) and Peroxidase enzyme (1.80 unit/mg) were found maximum in variety /germplasms Arka vikas & NDTH-108. have highest total sugar (6.40 %) and non-reducing sugar (1.80 %) at ripening stage was found maximum in variety CO-3, T.S.S. content (4.83 %) at ripening stage was found highest in germplasms NDTH-101 and reducing sugar (4.77 %) was found maximum in germplasms Kalyanpur Selection-6, Total free amino acid (12.73 mg/100g) as found maximum in germplasms Kalyanpur Selection-6. Maximum lycopene (4.93 mg/100g) at ripening stage was found in germplasms Kalyanpur Selection-6.

Key words:- Fruit size, weight, specific gravity, colour, lycopene, β carotene, chlorophyll a and b , ascorbic acid, total mineral, titrable acidity Polyphenol oxidase, Peroxidase. T.S.S., total sugar, non-reducing sugar, reducing sugar, lycopene and total free amino acid.

Introduction

The tomato (Lycopersicon esculentum Mill.) is one of the most widely consumed and most popular fresh vegetable in the industrialized world. Tomato belongs to the family Solanaceae having diploid chromosome number (2n=24). It is the world's largest vegetable crop after potato and sweet potato but it tops the list of canned vegetables. It is an important condiment in most diets and a very cheap source of vitamins and antioxidents. It also contains a large quantity of water and calcium and Niacin which are of great importance in the metabolic activities. Tomato is a good source of vitamins A, C, E and minerals that are very good for body and protect the body against diseases (Taylor, 1987).

Tomato is the second most widely grown vegetable crop in the world other than potato (**Hanson et al., 2001**). Canada is the second larger producer of tomato next to Mexico. Total area of world under tomato cultivation is 4.50 million ha and total production is 240.51 million tonnes with 31.8 tonnes /ha productivity whereas, in India total area is 0.767 million ha and production is 16.385 million tonnes with 21.353 million tonnes /ha productivity. In U.P., total area is 0.010 million ha, production is 0.413 million tonnes with 39.488 million tonnes /ha productivity. (**NHB, 2014-15**). Tomato crop is adapted to a wide variety of climates ranging from the tropics to within a few degrees of the Arctic Circle. However, in spite of its broad adaptation, production is concentrated in few warm and rather dry areas. Though, it is a perennial plant in tropical climates, it is grown as an annual in North America. Tomatoes find numerous uses in both fresh and processed forms that include ketchup, sauces, pastes and juice. Tomato is considered as an important cash generating crop for small holders and medium scale commercial farmers providing employment opportunity in the production and processing industries (**Naikaet al., 2005**).

Tomatoes commonly consumed in daily diets are a major source of antioxidants. Tomatoes being an important source of potassium, phosphorus, magnesium, iron, so necessary to the normal activity of nerves and muscles. Vitamins as A, B and C tomatoes is the third source of vitamin C in our diet and the fourth for vitamin A, through its content in beta-carotene or pro vitamin A. Phytosterols, compounds that help to keep cholesterol under control folic acid, which helps eliminate homocysteine, an amino acid whose metabolism is dependent on the metabolism of vitamins from B complex, especially that of folic acid. Compositionally, the tomato has a unique nutritional and phyto-chemical profile. The major phyto-chemicals in tomato are the carotenoids consisting of 60 to 64% lycopene, 10 to 12% phytene, 7 to 9% neurosporene, and 10 to 15% carotenes. Tomatoes based foods are the world rich sources of lycopene (**Sgherri et al., 2008**). Based on a fresh weight basis, tomato (on average) contains about 35 mg/kg of lycopene, with red cultivars containing in average 90 mg/kg of lycopene and yellow ones only 5 mg/kg Processed tomatoes (sauce, paste, juice, and ketchup) contain 2- to 40-fold higher lycopene than fresh tomatoes.

Materials and Methods

The experiment was conducted in the department of vegetable science at MES of vegetable farm, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P) during the Rabi season 2016-2017. The climate of Ayodhya comes under the category of semi-arid.

The fruit size has been taken by varnier callipors and specific gravity by water displacement methods. Total chlorophyll, total free amino acid and chlorophyll a and d were analysed by Jayraman (1981). TSS and acidity have been done by Rangana (1986) Reducing sugar have been analysed by Miller (1959) and Total sugar by the Dubois,et.al method. Lycopene have been done by Adsule etal.1979 and β carotene by Collumn method, 1953.Total mineral content have done by hort and Fischer, 1971 method and ascorbic acid by AOAC,1970 method. Polyphenol oxidase have been determined by Farkas *etal*. 1962 and Peroxidase was analysed by MaCune and Galston 1959.

Results and Discussion

The fruit length varied from 3.90-4.83 cm at ripening stage was respectively. These results are nearly corresponding with **Chattopadhyay *el al.* (2013)**. The fruit size decreases at ripening stage is attributed to the loss of moisture and carbohydrates in accordance with **Karki (2005)**. The fruit diameter varied from 4.80-7.17 cm at ripening stage. These results are nearly corresponding with **Chattopadhyay *el al.* (2013)**. The fruit size decreases at ripening stage is attributed to the loss of moisture and carbohydrates in accordance with **Karki (2005)**.

In the present investigation, average fruit weight of tomato varieties / strains at ripening stage was ranged from 46.97-95.33 g, the similar data was found by Leonardi ***et al.* (2000)**. The fruit weight decreases within excepted of weight loss per cent, the mean weight loss at ripening stage was varied weight loss 11.16 per cent are in accordance with **Getinet *et al.* (2008)**.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 254-257
Received: 09-01-2019
Accepted: 12-02-2019

NAAS-5.2]

Effect on foliar application of potassium nitrate on physiological, biochemical and yield potential in different wheat [*Triticum aestivum* L.] cultivars under drought and irrigated conditions

Vinaya Kumar Yadav, Anil Kumar Singh, Prashansha Singh, Rajnish Kumar, Shubham Kumar Srivastav, Vikas Yadav and Ram Kalap Yadav

Vinaya Kumar Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Anil Kumar Singh
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Prashansha Singh
Department of Crop Physiology, N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Rajnish Kumar
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Shubham Kumar Srivastav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Vikas Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Ram Kalap Yadav
Department of Crop Physiology, N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Vinaya Kumar Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Abstract
The field experiments were conducted at Student Instructional Farm of CSAUAT Kanpur, during Rabi 2016-17 and 2017-18. The objective of investigation was to study the effect of foliar applied potassium nitrate and thio-urea with different doses on plant traits (physiological, biochemical, yield and its components) of two wheat varieties under drought and irrigated condition. It was designed in split-split plot design with three replications. The two conditions *i.e.* drought (I_0) and irrigated (I_1) conditions were allocated in the main plots and two wheat varieties *i.e.*, V_1 (K-1006) and V_2 (K-307) in sub plot and for each five chemical treatments were applied as foliar spray at heading stages by 500 ppm (T_3) and 1000 ppm thio-urea (T_4), along with control (T_0) in sub-sub plots. The significantly higher grain yield (5.30 & 5.12 gm) with best morpho-physiological, phenological and biochemical traits can be obtained by foliar application of 500ppm thio-urea (T_3) with both condition of *i.e.*, drought (I_0) and irrigated (I_1) of wheat crop. Next to this were 500ppm thio-urea (T_3) *i.e.* 5.30 & 5.26, 1000ppm thio-urea (T_4) *i.e.*, 5.12 & 5.08 as compare to control (T_0) *i.e.* 4.30 & 4.13 gm. Among cultivars, maximum responsive was K-1006 (V_1) in most of traits and gave significantly higher grain yield (5.30 & 5.23) and minimum in K--307 (V_2) *i.e.*, 5.12 & 5.08 gm with both concerning experimental years.

Keywords: Physiological, biochemical, yield attributes, foliar spray of thio-urea on drought and irrigated conditions

Introduction

Wheat consumption worldwide is estimated to 817 million tons by 2030 and production would need to increase at 22.6-43.6% in different countries at the current production level to meet the estimated consumption demand. India is the largest wheat producing country in the world after China. Wheat consumption worldwide is estimated to 817 million tons by 2030 and production would need to increase at 22.6-43.6% in different countries at the current production level to meet the estimated consumption demand. It gives me immense pleasure to bring out the current issue of Wheat & Barley Annual Report. I am also very delighted to share that during (Anonymous, 2017-18) [3], once again, the country has achieved a highest record wheat production of 99.70 mt which is very close to the magical figure of 100 mt from an area of 29.58 mha thereby registering an all-time high productivity of 3371 kg/ha. Similarly, in barley also the country harvested a record production of 1.77 mt from an area of 0.66 mha achieving a record average productivity of 2679 kg/ha. It may be recalled that the total wheat production of the country during 1947-48 was just 5.6 million tons with average productivity of less than one t/ha. The wheat production has increased manifold from 6.60 million tonnes at the time of independence to 97.44 million tons in (Anonymous. 2016-17) [3]. The productivity has witnessed an increase by 473 per cent *i.e* from 670 kg/ha to 3172 kg/ha during the above period. Despite delayed sowing, the country recorded 30.71 million hectares. The clearly indicates the strength of systematic and planned wheat research in the country. Wheat consumption in India estimated to surpass 110 million tons of wheat will be needed by 2020. Drought is the most prevailing problem and the factor known to be serious for its impacts on crop limitations (Souza *et al*., 2004) [17]. This kind of abiotic stress often occurred its consequence of the reduction of the water level that reaches earth due to extreme atmospheric conditions which frequently cause water loss via transpiration and evaporation. Generally, water scarcity resulted from either drought or soil salinity influenced crop plant's morphology, physiology and could lead to cellular and organelles deformation. Drought specific impacts on biochemical and molecular processes lead to stomata closure with consecutive decrease in

604

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 355-358

Tulsi Ram Yadav
Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pradip Kumar Saini
Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sanjay Kumar Tripathi
Department of Crop Physiology, CSA University, Kanpur Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Raj Bhahadur
Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Pradip Kumar Saini
Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018)

Effect of seed priming with plant growth regulators on physiological changes of Indian mustard (*Brassica juncea* L. Czern & Coss.)

Tulsi Ram Yadav, Pradip Kumar Saini, Sanjay Kumar Tripathi, RK Yadav, Raj Bhahadur

Abstract
The investigation entitled "Effect of seed priming with plant growth regulators on physiological changes of Indian mustard (*Brassica juncea* L. Czern & Coss.)" was conducted during *rabi* season, 2016-17 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad (U.P.) in randomized block design with eight treatments, three replications and variety Narendra rai (NDR-8501).Various concentrations of GA_3 (100ppm, 150ppm, 200ppm) and SA (50ppm, 100ppm, 200ppm) were taken along with untreated control. Seed was soaked before 6 hrs of sowing. Observations were recorded at 40, 60, 80 DAS and at maturity. Biochemical parameters like, chlorophyll content, in green leaves, oil content (%) in dry seeds were taken. Seed soaking of different concentrations of GA_3 and SA influenced on all characters of mustard crop.

Keywords: SA, GA_3, mustard, chlorophyll, oil content, etc.

Introduction

Oilseeds crops are the second most important determinant of agricultural economy, next only to cereals. Today, the demand for vegetable oils is out pacing the supply with more than half of its annual requirements being met mainly through imports. India is the 5th largest vegetable oil economy in the world next to USA, China, Brazil and Argentina accounting for 7.4% world oilseed output, 6.1 % of oil meal production, 3.9% world oil meal export 5.8% vegetable oil production, 11.2% of world oil import and 9.3% of the world edible oil consumption (DRMR, 2013, Vision 2020). Rapeseed-mustard (Brassica spp.) is one of the most important oilseed crops of the world where India is ranking third in area and production in the world (DRMR, 2015). Among the seven edible oilseeds cultivated in India, rapeseed mustard contributes 28.6% in the total oilseeds production and ranks second after groundnut sharing 27.8% in the India's oilseed economy (Shekhawat *et al.* 2012) [27] however due to more oil content (ranging from 35-45%) rapeseed-mustard ranks first in terms of oil yield among all oilseeds crops. Its seed contains 37 to 49 percent edible oil (Singh *et al.*, 2009) [24]. Demand of edible oil has increased with increasing population and improvement in the living standard of the people, resulting thereby in short supply of edible oils which is being met with imports of edible oil worth 44,000 crores per annum. Thus, there is need to boost the oilseed production through area expansion and productivity enhancement.

Indian mustard (*Brassica juncea* L. Czern) belongs to family Cruciferae, genus Brassica and species juncea popularly known as rai. Mustard is cultivated mostly under temperate climate. It is also cultivated in certain tropical and subtropical region as a cold weather crop. In India, rapeseed-mustard occupy 5.99 million ha area with production and productivity of 6.31 million tones and 1053 kg/ha respectively (India stat 2015-16). Indian mustard (*Brassica juncea* L.) is an important rabi crop of Haryana. In Haryana, rapeseed and mustard is one of the major growing crop occupying 0.56 million ha of area, with production and productivity of 0.699 million tones and 1248kg/ha respectively (India stat 2015-16).

Priming of seed is a physiological pre- conditioning which is widely used in various crops. Which includes subjective of seeds to cycle of wetting, drying and incubation at low temperature. Seed priming is normally practiced with water and can be improved further by selection of inorganic chemicals and growth regulators. Material used in seed priming are

RESEARCH ARTICLE

RESPONSE OF ZINC ON GROWTH AND BIOCHEMICAL CHANGES OF WHEAT (*TRITICUM AESTIVUM* L.) UNDER SODIC SOIL

Uma Shanker[1]*, R.K. Yadav[2], Brij Mohan[3] and Satendra Kumar[4]

[1,3]*Department of Crop Physiology, Center of Advanced Faculty Training In Crop physiology, Department of Crop Physiology*
[2]*Department of Agronomy, N.D. University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad 224229 (U.P.) India*
[4]*Department of Soil Science, SVP University of Agriculture & Technology, Meerut (U.P.) India*
Email: umashunkar@gmail.com

Received-27.11.2017, Revised-29.04.2018

Abstract: The present investigation was carried out under field condition at main experiment station (MES) of Narendra Deva University of agriculture & Technology, Narendra Nagar, Kumarganj, Faizabad U.P. during Rabi season 2010-11. The experiment was executed in completely randomized block design (factorial) with three replications. Six treatments comprised of zinc application i.e. (control 1%, 1.5% $ZnSO_4$ seed soaking, 15 kg and 25 kg $ZnSO_4$ ha^{-1} basal application and 1% $ZnSO_4$ +2.5% urea foliar spray and three wheat verities (Raj-3077, NW-1014, UP-2425). Seed soaking, basal application and foliar spray of $ZnSO_4$ increased growth characters in all varieties of wheat. Wheat variety UP-2425 responded better in comparison to NW-1014 and Raj-3077. Variety UP-2425 performed maximum plant height number of tiller, Leaf area, dry weight plant^{-1} as compared to Raj-3077 and NW-1014 at the crop growth stages. A control sets was also maintained. Seed soaking, basal application and foliar spray of $ZnSO_4$ increased growth characters and biochemical changes in all varieties of wheat. Application of 25kg $ZnSo_4$ha^{-1} in soil significantly increased in chlorophyll content, carbohydrate content obtained. Wheat variety UP-2425 responded better in comparison to NW-1014 and Raj-3077. It is concluded from the results that basal application of 25 kg $ZnSo_4$/ha^{-1} was found superior and economical in comparison to other treatments.

Keywords: Zinc, Foliar application, Growth, Soluble carbohydrate, Chlorophyll

INTRODUCTION

Wheat (*Triticum aestivum* L.) a crop of poaceae family which is a major staple food crop of the world after rice. It is primarily grown in temperate region at higher altitude and medium altitude of tropical climate. However, it is cultivated widely around the world due to wide adoption and greater role in human nutrition as well as agricultural economy. With shrinking of arable land due to urbanization and industrialization, the wheat cultivation is also being pushed to marginal lands including salt affected soils. Sodic soil are widespread in the world and in India it occurs mainly in Indo-Gangetic alluvial plains, where it is estimated to cover about 2.8mha in India, salt affected soils are spread 7.0mha of which 1.29mha exists in U.P. alone (Abrol and Bhumbla 1971). However information of salts affected area in India indicates for 13.0mha. (Yadav and Gupta 1984).Salt affected soil contain excessive concentration of chloride and sulphate of sodium, calcium and magnesium (saline soil) or and excess of exchangeable sodium (alkaline or sodic soil) along with carbonate and bicarbonates. Excessive exchangeable sodium, high pH and poor physical properties of soils are known to adversely affect the growth, yield, chemical composition and nutrients uptake of plant. The adverse effect of soil sodicity is also mediated through the unavailability of certain micronutrients like zinc and iron. The available zinc in Indian soil ranges between 0.08-20.5ppm. Application of zinc have been found to boost the growth and yield of crops to a great extent (Zaid et al. 1977) Zinc deficiency includes rosting and poor tillring leading to decreased productivity in crop plants, since zinc is co-factor of carbonic anahydrase and sithse there fore it may adversely affect enzyme activities and carries corresponding metabolic reaction when zinc is deficient in soil. Zinc is also involved in synthesis of protein tryptophan (amino acid), superoxide dismutase (SOD) activity is much lower but can be restured in vitro by resupplying zinc to the assay medium (Vaugh an et al. 1982).

MATERIALS AND METHODS

The present study was conducted to investigate the response of wheat genotypes Raj-3077, NW-1014, UP-2425, to different treatmentT_1, Control,T_2, Seed soaking- .0% ZnSo4 (Soaking for 4 hours and drying in shade for 24 hours before sowing). T_3, Seed soaking-1.5% ZnSo4 (Soaking 4 hours and drying in shade for 24 hours before sowing). T_4,ZnSo4-15 Kg/ha basal application. T_5, ZnSo4-25 Kg/ha basal application. T_6, Foliar Spray at tillring and booting stage-1.0%ZnSo4+2.5%Urea.Wheat genotypes was collected from seed resource centre of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). Seed soaking with respectively $ZnSo_4$ solution was done for four hours and then soaked seed were dried in shade for 24-

*Corresponding Author

Journal of Pharmacognosy and Phytochemistry 2018; SP2: 80-82

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 80-82

Pradeep Saini
Department of Crop Physiology, NDUA&T, Faizabad, Uttar Pradesh, India.

RK Yadav
Department of Crop Physiology, NDUA&T, Faizabad, Uttar Pradesh, India.

Nikita Nehal
Department of Crop Physiology, NDUA&T, Faizabad, Uttar Pradesh, India.

Nitish Sharma
Department of Crop Physiology, NDUA&T, Faizabad, Uttar Pradesh, India.

Correspondence
Nitish Sharma
Department of Crop Physiology, NDUA&T, Faizabad, Uttar Pradesh, India.

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018)

Effect of different levels and sources of phosphorous on biochemical changes of wheat (*Triticum aestivum* L.) under sodic soil

Pradeep Saini, RK Yadav, Nikita Nehal and Nitish Sharma

Abstract
The present investigation entitled "Effect of different levels and sources of phosphorous on biochemical changes of wheat (*Triticum aestivum* L.) under sodic soil" was carried out at the Main Experimental Station (MES), Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during *rabi* season of 2015-16. The experiment was laid down in randomized block design with three replications on wheat variety NW 1014 and pH of the soil is 9.4. Seven treatments were given and are comprised of T1: Control T2: 60 kg /ha through SSP, T3: 60 Kg Phosphorus /ha. through DAP. T4: 80 Kg Phosphorus /ha. through SSP, T5:80 Kg Phosphorus /ha. Through DAP, T6:100 Kg phosphorus/ha. through SSP, T7:100 Kg Phosphorus /ha. through DAP. Observations were recorded on chlorophyll, carbohydrate and protein content in leaves at 30, 60, 90 DAS.. All the levels and sources of phosphorus positively influenced biochemical changes positively however, the effect of T4: 80 Kg Phosphorus /ha. Through DAP was found most effective and significantly increased chlorophyll, carbohydrate and protein content in leaves of wheat.

Keywords: Wheat, Sodic soil, Carbohydrate, Chlorophyll, Protein.

Introduction
Wheat (*Triticum aestivum* L.) is the important crop of India. It is consists second position in both area and production after rice in India as well as world after china. The Northern and Western part of India has maximum area and production under wheat cultivation. The record production in the country during last few years has enabled India to attain the position of being second largest producer of wheat in the world.

Sodic soil are widespread in the world and in India. It occurs mainly in Indo-Gangetic alluvial plains, where it is estimated to cover about 2.8 mha. In India, salt affected soils are spread 7.0 mha of which, 1.29 exists in U. P. alone (Abrol and Bhumbla 1971) [5]. However, information on salt affected area in India indicates for 13.0 mha (Yadav and Gupta, 1984). Salt affected soils contain excessive concentration of chloride and sulphate of sodium, calcium and magnesium (Saline soil) or excess of exchangeable sodium (alkaline or sodic soil) along with carbonate and bicarbonate. These affected soils are extensively distributed in arid and semi arid parts of Haryana, Punjab, Uttar Pradesh, Rajasthan, Gujrat, and Maharastra. The soil affected soil in U. P. are spread over several districts including Sultanpur, Raibarreilly, Azamgarh, Etawah, Pratapgarh, Ballia, Mau, Mainpuri, Hardoi, Kanpur, Faizabad, Jaunpur and Fatehpur (Singh and Tyagi 1980) [8].

Phosphorus is critical in the metabolism of plant, playing a role in cellular energy transfer, respiration and photosynthesis. It is also a structural component of the nucleic acid of gens and chromosome it works as many coenzymes, phosphoproteins and phospholipids, early season limitation in phosphorus availability can result in restriction in crop growth, from which the plant will not recover even when phosphorus supply of is increased to adequate level. An adequate supply of phosphorus is essential from the earliest stage of plant growth (Betaerd, *et al.* 2003). Beside many other factor, fertilizer play a vital role in increasing the crop yield. Commonly used fertilizer are nitrogen, phosphorus and potash. Phosphorus is the second major nutrient after nitrogen for plant growth which play a fundamental role in large number of enzymatic reaction that depend upon the energy transfer or phosphorylation (20). Recovery of applied Phosphorus reported in the literature is low (0.02-0.5%) in alkaline calcareous soil

562

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3745-3750

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 3745-3750
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation of Wheat (*Triticum aestivum* L.) Varieties for Heat Tolerance at Grain Growth Stage by Physio-Molecular Approaches

Shambhoo Prasad[1*], Bandana Jaiswal[1], Sonam Singh[1], Reena Rani[1], Vishwajeet Yadav[1], Ashish Kumar[1], Vishwas Mishra[1], N. A. Khan[1], R. K. Yadav[2] and M. P. Singh[2]

[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
[2]Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
Corresponding author

A B S T R A C T

An experiment was conducted with six wheat varieties K 911, PBW 343, Raj 3765, K 9006, AAU 11 and HD 2733 for evaluation for heat tolerance at grain growth stage. Heat treatment was given by delayed sowing of 60 days from normal date (15 November) so that wheat varieties could experience severs heat stress (37-39^{0}C) at reproductive stage. Agronomic practices were followed as per recommendation for wheat crops. Wheat varieties were screened on the basis of membrane stability index (MSI), chlorophyll stability index (CSI) and canopy temperature depression (CTD) at grain growth stage. K 911, Raj 3765 and AAU 11 had high MSI, CSI, and CTD and also showed less percent reduction in yield and yield components over PBW 343, K 9006 and HD 2733. Fifteen RAPD markers were tested for genetic variability for heat tolerance. Out of fifteen markers only three molecular markers showed variation for heat tolerance. Therefore, MSI, CSI and CTD can be used as major criteria for heat tolerance in wheat.

Keywords

Heat stress, MSI, CSI, CTD, Molecular marker, Tolerance and Wheat

Introduction

Wheat (*Triticum aestivum* L.) is the important crop of India. It is consists second position in both area and production after rice in India as well as world after china. The Northern and Western part of India has maximum area and production under wheat cultivation. There are number of constraints which affect the wheat production and decrease the nutritive value of the wheat. Now a day's heat stress in wheat is becoming major constrain in wheat at grain filling stage. Heat stress is often defined as the rise in temperature beyond a threshold level (26^{0}C) for a period of time sufficient to cause irreversible damage to plant growth and development. In general, a transient elevation in temperature, usually 10-15^{0}C ambient is considered heat stress. However heat stress is a complex function of intensity (temperature in degree) duration and rate of increase in temperature. According to a report of the Intergovernmental Panel on climatic change (IPCC) global mean temperature will rise 0.3^{0}C per decade (Jones *et al.*, 1999) reaching to approximately 1 and 3^{0}C above the present value by years 2025 and 2100, respectively and leading to global warming.

Int.J.Curr.Microbiol.App.Sci (2017) 6(10): 225-229

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 10 (2017) pp. 225-229
Journal homepage: http://www.ijcmas.com

NAAS RATING - 5.38

Original Research Article

https://doi.org/10.20546/ijcmas.2017.610.028

Effect of Integrated Nutrient Management on Soil Properties, Yield Attributes and Yield of Wheat (*Triticum aestivum* L.)

Abhimanyu Yadav[1], Adesh Kumar[2]*, Ved Prakash[2], Neeraj Kumar[2], Ashutosh Tiwari[2] and R.K. Yadav[3]

[1]Department of Soil Science and Agricultural Chemistry, [2]Department of Plant Biotechnology, [3]Department of Crop Physiology, N.D. University of Agriculture and Technology, Narendra Nagar (Kumarganj) Faizabad -224 229 (U.P.), India

**Corresponding author*

Keywords

Integrated Nutrient Management, Yield, Soil properties.

Article Info

Accepted:
04 September 2017
Available Online:
10 October 2017

ABSTRACT

A field experiment was conducted during winter season of 2014-15 on wheat at Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (UP). The soil of the experimental field was silt loam having pH 8.25, EC 0.35 dSm^{-1}, organic carbon 4.4 g/Kg^{-1} available nitrogen 195 Kg ha^{-1}, available P 12 Kg ha^{-1} and available K 240 Kg^{-1} the experiment was consisted of 8 treatments viz. T_1 (control), T_2 (100 % RDF), T_3 (75 % RDF), T_4 (75 % RDF + 25 % N-FYM), T_5 (75% RDF + *Azotobacter*), T_6 (50 % RDF + 50 % N-FYM) 7- (50 % RDF + 50 %N-FYM + PSB) and T_8 (50 % RDF + *Azotobacter* + PSB) were laid in the randomized block design with three replication. The highest values of yield and yield attributes were recorded with treatment T_7 (50% RDF + 50% N- FYM + PSB) which was significantly superior over control as well as T_2 (75% RDF), T_5 (75% RDF + *Azotobacter*) and T_6 (50% RDF + *Azotobacter* + PSB) and statistically at par with rest of the treatments.

Introduction

Wheat (*Triticum aestivum* L.) is one of the most important cereal crops of the world. Among the world's most important food grains, it ranks next to rice. It is eaten in various forms by more than one billion in the world. Millions of farmer in developing countries need adequate resource for augmenting crop. productivity and sustainability of soil. Therefore to maintain fertility and productivity of soil at sustainable level for long duration, there is need to adopt the concept of integrated nutrient management. Organic manure such as farm yard manure, vermin-compost, crop residues, biofertilizer, green manure and chemical fertilizer are considered to be an integral component of integrated nutrient management and may help to recover soil health in cropping system. As they improve soil fertility and physical properties such as soil structure, aeration, porosity, infiltration rate and water holding capacity and decrease soil crusting, organic matter in soil improve physical condition of the soil for better performance of micro-organism and physical status of soil. Organic matter affects crop

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 355-358

Tulsi Ram Yadav
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pradip Kumar Saini
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Yadav,
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Raj Bhahadur
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Pradip Kumar Saini
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018) NAA-S-5.21

Effect of seed priming with plant growth regulators on physiological changes of Indian mustard (*Brassica juncea* L. Czern & Coss.)

Tulsi Ram Yadav, Pradip Kumar Saini, RK Yadav, Raj Bhahadur

Abstract
The investigation entitled "Effect of seed priming with plant growth regulators on physiological changes of Indian mustard (*Brassica juncea* L. Czern & Coss.)" was conducted during *rabi* season, 2016-17 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad (U.P.) in randomized block design with eight treatments, three replications and variety Narendra rai (NDR-8501).Various concentrations of GA_3 (100ppm, 150ppm, 200ppm) and SA (50ppm, 100ppm, 200ppm) were taken along with untreated control. Seed was soaked before 6 hrs of sowing. Observations were recorded at 40, 60, 80 DAS and at maturity. Biochemical parameters like, chlorophyll content, in green leaves, oil content (%) in dry seeds were taken. Seed soaking of different concentrations of GA_3 and SA influenced on all characters of mustard crop.

Keywords: SA, GA_3, mustard, chlorophyll, oil content, etc.

Introduction

Oilseeds crops are the second most important determinant of agricultural economy, next only to cereals. Today, the demand for vegetable oils is out pacing the supply with more than half of its annual requirements being met mainly through imports. India is the 5th largest vegetable oil economy in the world next to USA, China, Brazil and Argentina accounting for 7.4% world oilseed output, 6.1 % of oil meal production, 3.9% world oil meal export 5.8% vegetable oil production, 11.2% of world oil import and 9.3% of the world edible oil consumption (DRMR, 2013, Vision 2020). Rapeseed-mustard (Brassica spp.) is one of the most important oilseed crops of the world where India is ranking third in area and production in the world (DRMR, 2015). Among the seven edible oilseeds cultivated in India, rapeseed mustard contributes 28.6% in the total oilseeds production and ranks second after groundnut sharing 27.8% in the India's oilseed economy (Shekhawat *et al*., 2012) [27] however due to more oil content (ranging from 35-45%) rapeseed-mustard ranks first in terms of oil yield among all oilseeds crops. Its seed contains 37 to 49 percent edible oil (Singh *et al*., 2009) [24]. Demand of edible oil has increased with increasing population and improvement in the living standard of the people, resulting thereby in short supply of edible oils which is being met with imports of edible oil worth 44,000 crores per annum. Thus, there is need to boost the oilseed production through area expansion and productivity enhancement.

Indian mustard (*Brassica juncea* L. Czern) belongs to family Cruciferae, genus Brassica and species juncea popularly known as rai. Mustard is cultivated mostly under temperate climate. It is also cultivated in certain tropical and subtropical region as a cold weather crop. In India, rapeseed-mustard occupy 5.99 million ha area with production and productivity of 6.31 million tones and 1053 kg/ha respectively (India stat 2015-16). Indian mustard (*Brassica juncea* L.) is an important rabi crop of Haryana. In Haryana, rapeseed and mustard is one of the major growing crop occupying 0.56 million ha of area, with production and productivity of 0.699 million tones and 1248kg/ha respectively (India stat 2015-16).

Priming of seed is a physiological pre- conditioning which is widely used in various crops. Which includes subjective of seeds to cycle of wetting, drying and incubation at low temperature. Seed priming is normally practiced with water and can be improved further by selection of inorganic chemicals and growth regulators. Material used in seed priming are aqueous solution of salts (sodium chloride, sodium sulphate, potassium nitrate etc.) growth

Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 254-258

Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Gupta
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

RS Yadav
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

KD Singh
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

AK Srivastav
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

(Special Issue- 4) NAAS-5.21
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

Vishuddha Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK Srivastav

Abstract
An experiment was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The experiment comprised of twelve treatments *viz.* T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), T_3 (100% N through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF +50% N through FYM), T_6 (50% RDF +50% N through Poultry Manure). T_7 (50% N through FYM+50% N through Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T_9 (75% RDF +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure). T_{11} (25% RDF +75% N through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in Randomized Block Design with three replications. the results revealed that the maximum plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of nodules $plant^{-1}$ were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) fallowed by 75% RDF +25% N through poultry manure and 75% RDF +25% N through FYM.

Keywords: FYM, Poultry manure, INM, growth, RDF, plant height, and leaf

Introduction
Berseem (*Trifoliumalexandrinum* L.) is one of the most important winter forage crop of India, due to high forage yield, palatability and nutritive value. It has become a very popular as *rabi* forage in irrigated areas or all most all over the country. Berseem belongs to one of the largest and most useful plant family leguminaceae and sub family faboideae. Berseem is known as king of fodder crops and it is popular among the world. It is one of the oldest cultivated crops, domesticated in Egypt and later introduced into many other parts of the world. Berseem was introduced in India in 1903 (Roy *et al*., 2009) [5]. It is now widespread in the irrigated regions of west and south Asia. Most of the farmers conserved the berseem as hay to get cheap, palatable and nutritive forage during scarcity periods or early winter and summer. Berseem is a cheapest source of increasing milk production as well as improving soil fertility. Berseem can be sown in early autumn and can thus provide feed before and during the colder months but the optimum conditions are 18-25 °C. If the winter temperature falls to 6-8° C the crop growth is severely affected. This is nutritious, succulent and palatable fodder available for fairly long period during winter, spring and early summer (Chaterjee and Das, 1989) [2]. Grazing is possible though less common than cutting. The most important cultural practices that need to be carefully adjusted to achieve maximum benefit from the forage grass-legume mixtures. The ability to fix atmospheric nitrogen and convert it to a useable form for plant growth is the main trait to these legumes (Allen and Allen, 1981) [1].

Poultry manure is an excellent soil amendment that provides nutrients for growing crops and also improves soil quality when applied widely, because it has high organic matter content combined with available nutrients for plant growth (Ryssen *et al.*, 1993) [7]. The application of FYM with chemical fertilizers and composted with rock phosphate to improve crops yield is very well established (Shafi *et al*., 2012) [8]. Fertilizers play an important role in enhancing forage productivity. Chemical fertilizers are soluble and immediately available to the plants: therefore, the effect is usually direct and fast, the price is lower and they are quite high in

484

[illegible]
[illegible]
[illegible]

Plant Archives Vol. 17 No. 1, 2017 pp. 580-584 ISSN 0972-5210

EFFECT OF PLANT GROWTH REGULATORS ON GROWTH, BIOCHEMICAL AND YIELD OF INDIAN MUSTARD [*BRASSICA JUNCEA* (L.) CZERN. & COSS.] UNDER DROUGHT STRESS CONDITION

Nikita Nehal*, Nitish Sharma, Monika Singh, Prashansha Singh, Priyanka Rajpoot[1], Anand Kumar Pandey, A. H. Khan, A. K. Singh and R. K. Yadav

Department of Crop Physiology, Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Faizabad - 224229 (Uttar Pradesh), India.

[1]Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Faizabad - 224 229 (Uttar Pradesh), India.

Abstract

The present investigation entitled "Effect of plant growth regulators on growth and yield of Indian mustard [*Brassica juncea* (L.) Czern. & Coss.] under drought stress condition" was conducted during *Rabi* season, 2013-14 at the Student Instructional Farm (SIF) of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.), India. Experiment was setup in randomized block design with twelve treatments, *viz.* and three replications on mustard variety Narendra rai under normal and drought conditions. PGRs were applied on the foliage of plant at 30 DAS. Drought was imposed for 30 days by curtailing irrigation at 30 DAS and normal condition plots were irrigated at 30 DAS. Normal and drought conditions plots were irrigated at 60 DAS. On the basis of results obtained foliar application of plant growth regulators improved all the growth (plant height and number of branches plant^{-1}) and biochemical parameters (chlorophyll and proline content in leaves) as well as the yield and yield attributing characters under normal and drought conditions. But the effect of PGRs were more pronounced under drought condition and they minimize the detrimental effect on mustard.

Key words : Mustard, GA_3, SA, ABA, Morphological traits and Grain yield

Introduction

Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeis guineensis* Jacq.). India is the fourth largest oilseed economy in the world. Among the seven edible oilseeds cultivated in India, rapeseed-mustard contributes 28.6% in the total oilseeds production and ranks second after groundnut sharing 27.8% in the India's oilseed economy. The share of oilseeds is 14.1% out of the total cropped area in India, rapeseed-mustard accounts for 3% of it. The global production of rapeseed-mustard and its oil is around 38-42 and 12-14MT, respectively. India contributes 28.3% and 19.8% in world acreage and production. India produces around 6.7MT of rapeseed-mustard next to China (11-12MT) and EU (10-13MT) with significantly contribution in world rapeseed-mustard industry.

*Author for correspondence : E-mail : nikitanehal1989@gmail.com

Rapeseed and mustard occupy an important position among oilseed. In world the total area under rapeseed-mustard during 2012-2013, was 34.19 M ha with the production of 63 m t and productivity was 1850 kg/ha. In India, the total area under rapeseed-mustard during 2012-13 was 6.3 M ha with the production of 7.4 MT and productivity of 1176 kg/ha. During 2011-12 in Uttar Pradesh, the total area of rapeseed was 0.64 M ha with the production of 0.79 MT and productivity of 1256 kg/ha (Anonymous, 2013).

Drought is a major environmental cue impairing many physiological and metabolic processes in plants, which may lead to suppressing plant growth and development, reducing crop productivity and promote plant death. Across plant species drought imposes various physiological and biochemical limitations and adverse effects (Chaves *et al*., 2004 and Wang *et al*., 2003). For example, drought stress elevates generation of reactive oxygen species,

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF SALICYLIC ACID AND CYCOCEL ON GROWTH AND YIELD ATTRIBUTES OF MUSTARD (*BRASSICA JUNCEA* L. CZERN&COSS)

R.K.Yadav, Pradip Kumar Saini, Aditya Singh, A.K.Singh, R. N Kewat and Shambhoo Prasad
Department of Crop Physiology
Narendra Deva University of Agriculture and Technology,
Kumarganj, Faizabad-224 229 (U.P.)

Abstract

The investigation entitled "Effect of salicylic acid and cycocel on growth and yield attributes of mustard (*Brassica juncea* L. Czern&Coss)" was conducted during *rabi* season, 2016-17 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad (U.P.) in randomized block design with 7th treatments, three replications and variety Narendra rai (NDR-8501). Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm) , (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on growth parameters like Plant height (cm), Total number of branches plant^{-1}, Dry matter partitioning plant^{-1}, Leaf area plant^{-1} and yield parameters like Number of siliquae plant^{-1}, Number of seeds plant^{-1}, Test weight (1000 seed weight), Seed yield plant^{-1} (g), Biological yield (q ha^{-1}), Seed yield (q ha^{-1}), Harvest index (%). Plant growth regulators influenced plant height, a number of branches plant^{-1}, dry matter partitioning^{-1} and leaf area^{-1}. The effect of salicylic acid 200ppm was more pronounced followed by salicylic acid 100ppm and cycocel 200ppm and all yield attributing characters like a number of siliquae plant^{-1}, a number of seeds plant^{-1}, total dry weight plant^{-1}, seed yield plant^{-1} and test weight showed positive response with plant growth regulators. Maximum increase was observed in salicylic acid 200ppm.

Keyword: Salicylic acid, Growth, Cycocel, Yield

Introduction

Oilseed crops play an important role in the agricultural economy of India. Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeis guineensis* Jacq.). Mustard is an important *rabi* crop of Rajasthan, Gujarat, Madhya Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal, and Assam. India is one of the largest rapeseed-mustard growing countries in the World, occupying the first position in the area and third position in production after China and Canada. Brassica (rapeseed-mustard) is the second most important edible oilseed crop in India after groundnut and accounts for nearly 30 percent of the total oilseeds production and 13 percent of the country's gross cropped area. When compared to other edible oils, the rapeseed-mustard oil has the lowest amount of harmful saturated fatty acid. It also contains an adequate amount of the two essential fatty acids (*i.e* linoleic and linolenic acids) which are not present in many of the other edible oils. Rapeseed-mustard seed was primarily used for human consumption because of low *erucic acid* and thus, becoming desirable edible oil. With the invention of steam power, it was found that the oil could be used as a lubricant that would be used for cleaning water steam-washed metal surfaces better than any other lubricant.

India occupies the second position in the area after China and third position in the production of rapeseed-mustard in the world after China and Canada. In India, it is the second most important edible oilseed crop after groundnut sharing 25-30 percent Indian oilseed economy. The share of oilseeds is 14.1 % out of the total cropped area, in India, rapeseed-mustard accounts for 3% of it. Mustard seed is the second largest produced oilseed in the world with an area of 37.0 m ha, with the production of 63.09 m tones and productivity of 11.90 q ha^{-1}. India contributes 28.3 % and 19.8 % in world acreage and production. India produced around 7.4 mt of rapeseed-mustard next to China (11-12 mt) and EU (10-13 mt) with significant contribution in world rapeseed industry. Among the entire oilseed crops producing states in India, in U.P. the area under cultivation was 6.39 lakh /ha with a production of 7.9 lakh metric tonnes and productivity of 12.36 q ha^{-1} (2012-2013) (Anonymous, 2013). Rajasthan ranks first both in area and production and Gujarat has the highest productivity of mustard. In Uttar Pradesh, mustard is grown on 0.82-million-hectare area with the production of 0.90 million tonnes and productivity of 1141 kg ha^{-1}.

Salicylic acid is ortho-hydroxyl benzoic acid and is a secondary metabolite acting as analogous of growth regulating substances. It helps in protection of nucleic acids and prevention of protein degradation. The salicylic acid is also known to induce many genes coding for parthenogenesis and proteins in response to biotic and abiotic stresses (Enyedi *et al*., 1992). Foliar application of salicylic acid increased the IAA content in broad bean leaves. Foliar application of salicylic acid exerted a significant effect on plant growth metabolism when applied at physiological concentrations, and thus acted as one of the plant growth regulating substances (Kalarani *et al*., 2001).

Cycocel (2-Chloro ethyl three methyl ammonium chloride) is the most usual anionic plant growth, regulator. There are reports that anionic compounds treated plants were tolerant to drought conditions compared to untreated plants. Moreover, they had higher net photosynthesis potential. From a biochemical point of view, CCC prevents ent-kaurene synthesis in GA3 biosynthetic cycle leading to GA3 deficiency and the subsequent reduced vegetative growth reported that any yield increase by CCC was related to the enhanced dry matter accumulation. Cycocel foliar application increased cytokinin translocation from roots to shoots, leading to prolonged aboveground parts life-span and hence increased yield

Materials and Methods

The experimental site is situated at the student Instructional Farm of the university on the Faizabad Raibareli road, at a distance of 42 km from Faizabad city and 23 km away from Jagdishpur. In the present study, Variety Narendra rai (NDR-8501) Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm), (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on growth parameters like Plant height (cm), Total number of branches plant^{-1}, Dry matter partitioning plant^{-1}, Leaf area plant^{-1} and yield parameters like Number of siliquae plant^{-1}, Number of seeds plant^{-1}, Test weight (1000 seed weight), Seed yield plant^{-1} (g), Biological yield (q ha^{-1}), Seed yield (q ha^{-1}), Harvest index (%).

Statistical Analysis

Data recorded on various growth and yield attributes were subjected to statistical analysis by Fisher method of analysis of variance (Fisher and Yates 1949).

Results and Discussion

Plant height (cm)

All the treatments influenced plant height at all stages of observations. However, all the concentration of salicylic acid increased plant height while all the concentration of cycocel reduced plant height as compared to control at all stages of observation. However, maximum plant height was noted in T4 (salicylic acid @200ppm) at all the stages of observation i.e. 40 DAS (24.42cm), 60DAS (96.80cm), 80 DAS

Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.3069

NAAS RATING - 4.74

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **5 (4):** 331-340 (2017)

International Journal of Pure & Applied Bioscience

Research Article

OPEN ACCESS

Study of Yield and Yield Components of Wheat (*Triticum aestivum* L.) Genotypes at Grain Filling Stage under Heat Regimes

Bandana Jaiswal[1], Shambhoo Prasad[1*], Rakesh Dwivedi[1], Sonam Singh[1], Reena Rani[1], Shalini Shrivastava[1], Ajay Kumar[1] and R. K. Yadav[2]

[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P (India)

[2]Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P (India)

*Corresponding Author E-mail: shambhoonduat@gmail.com

Received: 1.06.2017 | Revised: 11.06.2017 | Accepted: 12.06.2017

ABSTRACT

A field experiment was conducted with wheat genotypes Halna, PBW 343, NW 1014, DBW 16, K 911 and AAI 11 during rabi 2015-16 at the student instructional farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P). Heat treatment was given by delayed sowing of 65 days (25 January) than normal date of sowing (23 November 2015). So, that wheat genotypes could experience severe heat stress at grain filling stage. The screening of wheat genotypes was done on the basis of plant height, tiller number per plant, days to 100% flowering, days to 100% maturity, stay green duration, number of spikes per plant, spike length, number of grain per spike, test weight and yield plant^{-1} at grain filling stage. The wheat genotypes Halna, NW 1014, DBW 16, K 911, and AAI 11 had high membrane stability index (MSI) and stay green duration also showed less percent reduction in yield and yield components comparatively PBW 343 and DBW 16. Therefore, MSI and stay green duration can be used as physiological screening indices for heat tolerance genotypes at grain filling stage.

Key world: *MSI, Stay green duration, Wheat, Heat stress, Yield components.*

INTRODUCTION

Wheat (*Triticum aestivum* L) is an important winter season cereal crop in India as well as in the many parts of the world. India has second position in both area and production after China. Wheat crop faces a number of abiotic stresses among which heat stress at grain filling is importance one. Heat stress may be defined as an increase in temperature above threshold level (> 30°C) and cause considerable damage to growth, development and finally yield of plant[1]. High temperature (> 30°C) at the time of grain filling is one of the major constraints in increasing productivity of wheat in tropical and sub-tropical countries[12].

Cite this article: Jaiswal, B., Prasad, S., Dwivedi, R., Singh, S., Rani, R., Shrivastava, S., Kumar, A. and Yadav, R.K., Study of Yield and Yield Components of Wheat (*Triticum aestivum* L.) Genotypes at Grain Filling Stage under Heat Regimes, *Int. J. Pure App. Biosci.* **5(4):** 331-340 (2017). doi: http://dx.doi.org/10.18782/2320-7051.3069

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue [5] 2017: 584-586
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE **OPEN ACCESS**

Evaluation of pearl millet germplasm using physico biochemical traits collected form Eastern U.P.

Jai Prakash Verma, R. N. Kewat, R. P. Singh, Pratibha Singh and R. K. Yadav
Dept. of Biochemistry, N.D.U.A & T. Kumarganj, Faizabad
*Corresponding author: jayprakashverma54@gmail.com

ABSTRACT

The present investigation was carried out to study the physical and biochemical properties of Pearl millet (Pennisetum glaucum L.) genotypes. The kernel husk ratio in Pearl millet germplasm was found in the range of 64:36 to 80:20.The colours of Pearl millet were very attractive with Pale yellow and light gray. The colour plays an important role as far as consumer's acceptance is concerned. The average test weights of grain sample taken for the study were noticed between 5.35 to 12.98 of Pearl millet germplasm, respectively. The various biochemical parameters such as Carbohydrate content NDBH-2 (64.24g/100g), crude fibre content in Pearl millet-4 (2.30g/100g), Total mineral content in Pearl millet-3 (2.26 g/100g) were also noticed in present investigation.

Key word: Pearl millet, total mineral, carbohydrate, crude fibre and seed colour of seeds.

Received 21.09.2017 Revised 24.10.2017 Accepted 03.11.2017

INTRODUCTION

Pearl millet (*Pennisetum glaucum*L.) is also known as spiked millet, candle millet or dark millet in Europe; cattail, pecilaria in USA; bulrish millet or dukhn in Africa; bajra, combo or sajje in India. Pearl millet is originated in central Africa. Pearl millet crop is grown in tropical semi-arid region of the world primarily in Africa and Asia. Pearl millet is well adapted to production system characterized by low rainfall (200-600 mm), low soil fertility and high temperature. Pearl millet belongs to the family gramineae (Poaceae, Grass family). The height of the pearl millet plant may range from 0.5 – 4.0 meter. The grains color may be nearly white, pale yellow, brown, grey, salt blue or purple. The grains of the pearl millet are about 3 to 4 mm long much longer than those of other millets. The weight of seeds usually ranges from 1.4 to 2.5g with a typical mean of 0.8gram [1]. India is the largest producer of pearl millet covering about 8.7 million ha of marginal and sub marginal lands. Rajasthan, Gujarat, Haryana, Uttar Pradesh and Maharashtra are the fifth important states cultivar of these crops. Total cultivated area of Pearl millet in Uttar Pradesh is around 0.84 million ha and production 0.95 metric tonns. [2]. People affected by gluten related disorders, such as celiac, non-celiac gluten sensitivity and wheat allergy suffers, who need gluten free diet can replaced gluten containing cereal in their diet. 100 gram pearl millet are provided 378 kcal energy, protein 11 percent, Carbohydrate 73 per cent, fat 4 percent, Several vitamin B, minerals such as calcium 8 mg, iron 3 mg, magnesium 114 mg and some other nutrients like selenium 2.7 micro gram (USDA).

MATERIALS AND METHODS

Ten germplasm of Pearl millet were collected from different districts of Uttar Pradesh namely Balrampur, Sultanpur, Faizabad, Jaunpur, Gazipur, Bahraich and Lakhimpur were used as experimental materials. Samples of Pearl millets were brought to Biochemistry laboratory of Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad (U.P.) after collection. They were analyzed for various physical and biochemical parameters. The collected Pearl millet was cleaned, dried and dried seed was then crushed by a pestle and mortar. Finally, the product was the desired Pearl millet powder. The chemical properties of the Pearl millet powder were analyzed and the results are summarized. The milling per cent of Pearl millet grain include the dehusking and determining by traditional method using wooden pestle and mortar determining hand operated wooden pestle mortar steel persist. One hundred gram Pearl millet germplasm were weight on balance and their husk was remove with hand operated okhali finally the husk and kernel weight were recorded and there ratio was calculated.1000 grains of Pearl millet were randomly selected from threshed crop of each plot and their weight recorded on balance to obtain test weight of

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-II) : 1587-1590 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

EFFECT OF DIFFERENT LEVELS AND SOURCES OF PHOSPHOROUS ON GROWTH, BIOCHEMICAL CHANGES AND YIELD OF WHEAT (*TRITICUM AESTIVUM* L.) UNDER SODIC SOIL

R.K. Yadav, A.K. Singh, Anand Kumar Pandey, Nitish Sharma, PradeepKumar, Chandra Pal, Prashansha Singh, R.N. Kewat

Department of Crop Physiology [1]*Department of Biochemistry*

Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, (U.P)-224229

ABSTRACT

The experiment was conducted in Randomized Block Design with three replications, wheat variety NW-1014. The experiment was laid out in field condition with seven treatments *viz.* T_1 (control), T_2 (60 kg SSP ha^{-1}), T_3 (60 kg DAP ha^{-1}), T_4 (80 kg SSP ha^{-1}), T_5 (80 kg DAP ha^{-1}), T_6 (100 kg SSP ha^{-1}), T_7 (100 DAP ha^{-1}). The different levels and sources of phosphorous were applied in field basal before sowing of seeds. Observations were recorded as germination percentage, (15 DAS after sowing) growth parameters, biochemical changes at 30, 60, 90 DAS and maturity after sowing. Yield and yield attributes traits were also recorded at harvest stage of crop. All the treatments increased the germination percentage, growth characters and biochemical changes superior over control. The maximum germination percentage was recorded with 80 kg DAP ha^{-1} over other treatments including control. Growth characters as plant height (cm) was found significantly superior, number of tillers plant^{-1}, dry matter plant^{-1}, total chlorophyll content (mg g^{-1} fresh weight), carbohydrate (mg g^{-1} dry weight) and protein content (%) in leaves were found significantly superior with basal application of 80 kg DAP ha^{-1} followed by 100 kg SSP ha^{-1} over control. Yield and yield contributing traits viz length of spike (cm), number of spike plant^{-1}, grains spike^{-1}, number of grains plant^{-1}, yield (g plant^{-1}), 1000 grains weight (g), yield (q ha^{-1}) and harvest index (%) were also found statistically superior with basal application 80 kg DAP ha^{-1} followed by basal application of 100 SSP ha^{-1} over control.

Wheat (*Triticum aestivum* L.) is the important crop of India. It is consisting second position in both area and production after rice in India as well as world after china. The Northern and Western part of India has maximum area and production under wheat cultivation. Indian wheat can be classified into four type (1) Emmer wheat (*Triticum dicoccum Schub L.*), (2) Macroni wheat (*Triticum durum Desf.*) (3) Common bread wheat (*Triticum aestivum L.*) and (4) Indian dwarf wheat (*Triticum spherococcum Mihi.*). Uttar Pradesh, Madhya Pradesh, Punjab, Bihar, Rajasthan, Haryana, Maharashtra and Gujarat are major wheat growing state in our country; of these U.P occupies a first place in terms of both area and production. Wheat is one of the important cereals due to its relatively higher niacin and thiamine content. In addition, it is also rich in "gluten" which provides spongy cellular texture of bread and baked product with shrinking of arable land due to urbanization and industrialization, the wheat cultivation is also being pushed to marginal lands including salt affected soil.

Sodic soil is widespread in the world and in India. It occurs mainly in Indo-Gangetic alluvial plains, where it is estimated to cover about 2.8 mha. In India, salt affected soils are spread 7.0 mha. of which, 1.29 exists in U.P. alone (Abrol and Bhumbla 1971). However, information on salt affected area in India indicates for 13.0 mha (Yadav and Gupta, 1984). Salt affected soils contain excessive concentration of chloride and sulphate of sodium, calcium and magnesium (Saline soil) or excess of exchangeable sodium (alkaline or sodic soil) along with carbonate and bicarbonate. These affected soils are extensively distributed in arid and semi arid parts of Haryana, Punjab, Uttar Pradesh, Rajasthan, Gujrat, and Maharastra. The soil affected soil in U. P. are spread over several districts including Sultanpur, Raibarreilly, Azamgarh, Etawah, Pratapgarh, Ballia, Mau, Mainpuri, Hardoi, Kanpur, Faizabad, Jaunpurand Fatehpur (Singh and Tyagi 1980).

The detrimental effect of sodicity on biomass production is attributed to osmotic as well as toxic effect of the ions on the physiological and biochemical function of the cells. The increasing level of soil sodicity resulted reduction in plant growth, tiller production, root and shoot (Dargan *et al.* 1976). Soil sodicity has been found to deforess protein synthesis and accelerate its degradation in plants. In general, the level of reducing sugar and starch decreased in chloroplast, while those of non reducing sugar increased under saline condition. Salinity reduced growth and productivity in crop species due to excessive amount of salts, especially sodium cloride in the soil. Sodium cloride induces osmotic and ionic effects, leading to changes in plant metabolism (Qadir *et al.*, 2008) and reduced plant growth and development in many crop science (Sing *et al.*, 2007).

Plant Archives Vol. 17 No. 1, 2017 pp. 33-38 *ISSN 0972-5210*

EFFECT OF PLANT GROWTH REGULATORS ON GROWTH, BIOCHEMICAL CHANGES AND YIELD OF MUSTARD [*BRASSICA JUNCEA* (L.) CZERN. & COSS.]

Nitish Sharma*, Nikita Nehal, Monika Singh, Prashansha Singh, Priyanka Rajpoot[1], Anand Kumar Pandey, A. H. Khan, A. K. Singh and R. K. Yadav

Department of Crop Physiology, N. D. University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Faizabad - 224 229 (Uttar Pradesh), India.

[1]Department of Genetics and Plant Breeeding, N. D. University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Faizabad - 224 229 (Uttar Pradesh), India.

Abstract

The investigation entitled "Effect of plant growth regulators (PGRs) on growth, biochemical changes & yield of mustard [*Brassica juncea* (L.) Czern.& Coss.]" was conducted during *rabi* season, 2013-2014 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India in randomized block design with ten treatments, three replications and variety Narendra rai (NDR-8501). The treatments were comprised of foliar spray of 3 plant growth regulators (PGRs) of different concentrations *viz.*, Salicylic acid (0.1 mM, 0.3 mM, 0.5 mM), GA_3 (25 ppm, 50 ppm, 100 ppm) and kinetin (25 ppm, 50 ppm, 100 ppm) along with untreated control (distilled water spray) & spraying was done at 30 DAS. Observations were recorded at 60, 90 DAS and at maturity. The observations were taken on growth parameters like plant height, number of branches plant^{-1}, biochemical parameters like chlorophyll a & b content, oil content, yield characters like no. of siliquae plant^{-1}, no. of seeds plant^{-1}, setting percentage of siliquae. All the PGRs *viz.*, salicylic acid (0.1 mM, 0.3mM, 0.5mM), GA_3 (25 ppm, 50 ppm, 100 ppm) and kinetin (25 ppm, 50 ppm, 100 ppm) induced positive influence on the growth characters and chlorophyll content in plants but the foliar spraying of GA_3 50 ppm at 30 DAS was found more profound among all treatments. All the treatments enhanced the yield and yield contributing characters at all the doses in mustard. On the basis of above investigation it may be concluded that foliar spray of PGRs at 30 DAS may be used as a potential tool to improve growth and yield of mustard.

Key words : Mustard, GA_3, SA, kinetin, morphological traits and grain yield

Introduction

Oilseed crops play an important role in agricultural economy of India. Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeis guineensis* Jacq.). Mustard is an important *rabi* crop of Rajasthan, Gujarat, M.P, Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Assam. India is one of the largest rapeseed-mustard growing countries in the world, occupying the first position in area and second position in production after China.

Brassica (rapeseed-mustard) is the second most important edible oil seed crop in India after groundnut and accounts for nearly 30 per cent of the total oilseeds production and 13 per cent of the country's gross cropped area. When compared to other edible oils, the rapeseed-mustard oil has the lowest amount of harmful saturated fatty acid. It also contains adequate amount of the two essential fatty acids (*i.e.* linoleic and linolenic), which are not present in many of the other edible oils. Rapeseed-mustard seed was primarily used for human consumption because of low erucic acid and thus, becoming desirable edible oil. With the invention of steam power, it was found that the oil could be used as a lubricant that would be used for cleaning water steam-washed metal surfaces better than any other lubricant.

PGRs are organic compound other than nutrients that modify plant physiological process. PGRs are called bio-stimulants / bio-inhibitors act inside the plant cell to

**Author for correspondence :* E-mail : nitish1992@gmail.com

European Journal of Biotechnology and Bioscience
ISSN: 2321-9122
Impact Factor: RJIF 5.44
www.biosciencejournals.com
Volume 6; Issue 6; November 2018; Page No. 13-17

Plant Hormones: Their nature occurrence and functions: A chapter

RK Yadav[1], Pradip Kumar Saini[2]
[1-2] Department of Crop Physiology, N.D. University of Agriculture & Technology, Uttar Pradesh, India

Abstract
Plant hormones are a class of organic substances which are synthesized during the plant metabolism. They have an obvious physiological effect on plant growth at very low concentrations. Generally, plant hormones are mainly divided into five categories: Auxins, Gibberellins (GAs), Cytokinins, Ethylene, and Abscisic acid (ABA). With the deepening of research, some novel plant hormones such as Brassinosteroid, Salicylates, Jasmonates, Polyamines, and Signal Peptides have been found and identified. The plant hormone products are mainly obtained through plant extraction, chemical synthesis as well as microbial fermentation.

Keywords: gibberellins, ethylene, brassinosteroid, occurrence, biosynthesis

Introduction

Plant hormones are *a group of naturally occurring, organic substances which influence physiological processes at low concentrations*. The processes influenced consist mainly of growth, differentiation and development, though other processes, such as stomatal movement, may also be affected. Plant hormones have also been referred to as 'phytohormones' though this term is infrequently used. In their book *Phytohormones* Went and Thimann in 1937 define a hormone as a substance which is transferred from one part of an organism to another. Its original use in plant physiology was derived from the mammalian concept of a hormone. This involves a localized site of synthesis, transport in the bloodstream to a target tissue, and the control of a physiological response in the target tissue via the concentration of the hormone. Auxin, the first-identified plant hormone, produces a growth response at a distance from its site of synthesis, and thus fits the definition of a *transported* chemical messenger. However this was before the full range of what we now consider plant hormones was known. It is now clear that plant hormones do not fulfil the requirements of a hormone in the mammalian sense. The synthesis of plant hormones may be localized (as occurs for animal hormones), but it may also occur in a wide range of tissues, or cells within tissues. While they may be transported and have their action at a distance this is not always the case. At one extreme we find the transport of cytokine's from roots to leaves where they prevent senescence and maintain metabolic activity, while at the other extreme the production of the gas ethylene may bring about changes within the same tissue, or within the same cell, where it is synthesized. Thus, transport is not an essential property of a plant hormone. The term 'hormone' was first used in medicine about 100 years ago for a stimulatory factor, though it has come to mean a transported chemical message. The word in fact comes from the Greek, where its meaning is 'to stimulate' or 'to set in motion'. Thus the origin of word itself does not require the notion of transport *per se*, and the above definition of a plant hormone is much closer to the meaning of the Greek origin of the word than is the current meaning of hormone used in the context of animal physiology. Plant hormones2 are a unique set of compounds, with unique metabolism and properties, that form the subject of this book. Their only universal characteristics are that they are natural compounds in plants with an ability to affect physiological processes at concentrations far below those where either nutrients or vitamins would affect these processes.

The discovery, identification, plant hormones

The plant hormone concept probably derives from observations of morphogenic and developmental correlations by Sachs between 1880 and 1893. He suggested that "Morphological differences between plant organs are due to differences in their material composition" and postulated the existence of root-forming, flower forming and other substances that move in different directions through the plant. At about the same time Darwin was making his original observations on the phototropism of grass coleoptiles that led him to postulate the existence of a signal that was transported from the tip of the coleoptile to the bending regions lower down. After further characterizations by several workers of the way in which the signal was moved, Went in the Netherlands was finally able to isolate the chemical by diffusion from coleoptile tips into agar blocks, which, when replaced on the tips of decapitated coleoptiles, resulted in the stimulation of the growth of the decapitated coleoptiles, and their bending when placed asymmetrically on these tips. This thus demonstrated the existence of a growth promoting chemical that was asymmetrically resulted in a bending of the coleoptile away from the side with the higher concentration. This substance was originally named *Wuchsstoff* by Went, and later this was changed to *auxin*. After some false identifications the material was finally identified as the simple compound indoleacetic acid, universally known as IAA.

Effects of plant hormones, nature & occurrence

Before we become involved in the various subsequent

106

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 254-257
Received: 09-01-2019
Accepted: 12-02-2019

NAAS-5.2)

Effect on foliar application of potassium nitrate on physiological, biochemical and yield potential in different wheat [*Triticum aestivum* L.] cultivars under drought and irrigated conditions

Vinaya Kumar Yadav, Anil Kumar Singh, Prashansha Singh, Rajnish Kumar, Shubham Kumar Srivastav, Vikas Yadav and Ram Kalap Yadav

Vinaya Kumar Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Anil Kumar Singh
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Prashansha Singh
Department of Crop Physiology, N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Rajnish Kumar
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Shubham Kumar Srivastav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Vikas Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Ram Kalap Yadav
Department of Crop Physiology, N. D. U. A. & T. Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Vinaya Kumar Yadav
Department of Crop Physiology, C. S. Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Abstract
The field experiments were conducted at Student Instructional Farm of CSAUAT Kanpur, during Rabi 2016-17 and 2017-18. The objective of investigation was to study the effect of foliar applied potassium nitrate and thio-urea with different doses on plant traits (physiological, biochemical, yield and its components) of two wheat varieties under drought and irrigated condition. It was designed in split-split plot design with three replications. The two conditions *i.e.*, drought (I_0) and irrigated (I_1) conditions were allocated in the main plots and two wheat varieties *i.e.*, V_1 (K-1006) and V_2 (K-307) in sub plot and for each five chemical treatments were applied as foliar spray at heading stages by 500 ppm (T_3) and 1000 ppm thio-urea (T_4), along with control (T_0) in sub-sub plots. The significantly higher grain yield (5.30 & 5.12 gm) with best morpho-physiological, phenological and biochemical traits can be obtained by foliar application of 500ppm thio-urea (T_3) with both condition of *i.e.*, drought (I_0) and irrigated (I_1) of wheat crop. Next to this were 500ppm thio-urea (T_3) *i.e.*, 5.30 & 5.26, 1000ppm thio-urea (T_4) *i.e.*, 5.12 & 5.08 as compare to control (T_0) *i.e.*, 4.30 & 4.13 gm. Among cultivars, maximum responsive was K-1006 (V_1) in most of traits and gave significantly higher grain yield (5.30 & 5.23) and minimum in K–307 (V_2) *i.e.*, 5.12 & 5.08 gm with both concerning experimental years.

Keywords: Physiological, biochemical, yield attributes, foliar spray of thio-urea on drought and irrigated conditions

Introduction

Wheat consumption worldwide is estimated to 817 million tons by 2030 and production would need to increase at 22.6-43.6% in different countries at the current production level to meet the estimated consumption demand. India is the largest wheat producing country in the world after China. Wheat consumption worldwide is estimated to 817 million tons by 2030 and production would need to increase at 22.6-43.6% in different countries at the current production level to meet the estimated consumption demand. It gives me immense pleasure to bring out the current issue of Wheat & Barley Annual Report. I am also very delighted to share that during (Anonymous, 2017-18) [3], once again, the country has achieved a highest record wheat production of 99.70 mt which is very close to the magical figure of 100 mt from an area of 29.58 mha thereby registering an all-time high productivity of 3371 kg/ha. Similarly, in barley also the country harvested a record production of 1.77 mt from an area of 0.66 mha achieving a record average productivity of 2679 kg/ha. It may be recalled that the total wheat production of the country during 1947-48 was just 5.6 million tons with average productivity of less than one t/ha. The wheat production has increased manifold from 6.60 million tonnes at the time of independence to 97.44 million tons in (Anonymous, 2016-17) [3]. The productivity has witnessed an increase by 473 per cent *i.e.* from 670 kg/ha to 3172 kg/ha during the above period. Despite delayed sowing, the country recorded 30.71 million hectares. The clearly indicates the strength of systematic and planned wheat research in the country. Wheat consumption in India estimated to surpass 110 million tons of wheat will be needed by 2020.

Drought is the most prevailing problem and the factor known to be serious for its impacts on crop limitations (Souza *et al.*, 2004) [17]. This kind of abiotic stress often occurred as consequence of the reduction of the water level that reaches earth due to extreme atmospheric conditions which frequently cause water loss via transpiration and evaporation. Generally, water scarcity resulted from either drought or soil salinity influenced crop plant's morphology, physiology and could lead to cellular and organelles deformation. Drought specific impacts on biochemical and molecular processes lead to stomata closure with consecutive decrease in

604

International Journal of Chemical Studies

Techniques of seed priming in field crops

RK Yadav, Pradip Kumar Saini, Mayank Pratap and Sanjay Kumar Tripathi

Abstract
Priming in botany and agriculture is a form of seed planting preparation in which the seeds are pre-soaked before planting. Farmers do not have sufficient resources to meet the requirement of seedbed preparation for sowing and they are at more risk as compared to progressive farmers. On the other hand good establishment increases competitiveness against weeds, increases tolerance to drought period, increase yield and avoids the time consuming, need for re-sowing that is costly too. It is well accepted fact that priming improves germination, reduces seedling emergence time and improves stand establishment. A method to improve the rate and uniformity of germination is the priming or physiological advancement of the seed lot. The general purpose of seed priming is to partially hydrate the seed to a point where germination processes are begun, but they would exhibit rapid germination when re-imbibed under normal or stress conditions. A lot of work has been done on seed priming and results of these studies indicate well the importance of priming to get a good crop stand in many crops of tropical region such as rice, sorghum and maize.

Keywords: Seed priming, germination

1. Introduction
Various studies have been carried out to reduce the period between sowing to emergence as this play a key role in crop production. One of the important developments in this area has been the seed priming technique. The theory of seed priming was first proposed by Heydecker (1973) [21]. Seed priming is an effective technology to enhance rapid and uniform emergence and to achieve high vigour, leading to better stand establishment and yield. It is a simple and low cost hydration technique in which seeds are partially hydrated to a point where pre-germination metabolic activities start without actual germination, and then re-dried until close to the original dry weight. Seed priming is employed for better crop stand and higher yields in a range of crops. Harris *et al.*, (2007) [20] reported that seed priming led to better establishment and growth, earlier flowering, increase seed tolerance to adverse environment and greater yield at maize. The beneficial effects of seed priming have been demonstrated for many field crops such as wheat, sweet corn, mung bean, barley, lentil, cucumber, etc. (Sadeghian and Yavari, 2004) [40]. Rehman *et al.*, (2011) reported that seed priming is a cost effective technology that can enhance early crop growth leading to earlier and more uniform stand with yield associated benefits in many field crops including oilseeds.
Hormonal priming is the pre - seed treatment with different hormones like GA_3, kinetin, ascorbate etc., which promotes the growth and development of the seedlings. Ashraf *et al.*, (2005) found that GA_3 treatment enhanced the vegetative growth of two wheat cultivars. It enhanced the deposition of Na^+ and Cl^- in both root and shoots of wheat plant. It also caused a significant increase in photosynthetic at the vegetative stage of the crops.
Afzal *et al.*, (2006) reported that wheat cultivar Auqab-2000 was treated with different priming agents i.e. Abscisic acid (ABA), Salicylic acid (SA) and ascorbic acid and were sown under normal and saline condition (15 dSm^{-1}), and showed that under saline conditions these treatment reduced the time for 50% germination, increased final germination count, and significantly increased the fresh and dry weight but ascorbic acid did not show such results. Hormonal priming has reduced the severity of the effect of salinity but the amelioration was better due to 50ppm SA and 50ppm ascorbic acid treatments as these showed the best results on seedling growth, fresh and dry weights under non-saline and saline conditions whereas hormonal priming with ABA as not effective under present experimental material and conditions (Afzal *et al.*, 2006).

Correspondence
RK Yadav
Department Of Crop Physiology
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad, Uttar
Pradesh, India

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(3): 976-980
© 2019 IJCS
Received: 16-03-2019
Accepted: 18-04-2019

Prashanika Singh
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Vinaya Kumar Yadav
C.S. Azad University of
Agriculture & Technology
Kanpur, Uttar Pradesh, India

Ali Khan
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Ram Kalap Yadav
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

Correspondence
Prashanika Singh
Department of Crop Physiology
NDUA & T Kumargunj,
Ayodhya, Uttar Pradesh, India

The response of salicylic acid on growth, yield and yield components of wheat varieties on timely and late sown conditions

Prashanika Singh, Vinaya Kumar Yadav, Ali Khan and Ram Kalap Yadav

Abstract
The present investigation entitled "Effect of salicylic acid on growth, physio-chemical changes and yield of wheat (*Triticum sestivum* L.) Under high temperature at anthesis" was conducted at Students Instructional Farm of the Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during rabi seasons of 2014-15 and 2015-16. The experiment was planned under RBD (Randomized Block Design) with three replications. The treatment consisted of two date of sowing viz.25th November and 25th December with two varieties WH-3056 and WH-2036 with six salicylic acid treatment viz. (T1)Control, (T2)Seed soaking in (0.25mM) salicylic acid, (T3)Foliar spray of (0.25mM) salicylic acid at 30 DAS, (T4)Seed soaking in (0.25mM) salicylic acid + Foliar spray of (0.25mM) salicylic acid at 30 DAS,(T5)Seed soaking in (0.50mM) salicylic acid, (T6)Foliar spray of (0.50mM) salicylic acid at 30 DAS, (T7) Seed soaking in (0.50mM) salicylic acid + Foliar spray of (0.50mM) salicylic acid at 30 DAS,(T8)Seed soaking in (0.75mM) salicylic acid, (T9)Foliar spray of (0.75mM) salicylic acid at 30 DAS, (T10) Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS. Results indicated that growth attributes such as plant height, number of tillers per plant and dry weight per plant influenced with the date of sowing. When late sown variety was planted timely all the growth attributes showed drastic reduction with respect to late sowing (25th December).However, WH-3056 showed comparatively good performance in terms of growth attributes at timely sown (25th November). Performance of WH-3056 was very good as compared to WH-2036 due to delayed sowing on 25th December. Application of salicylic acid significantly increased all growth attributes in both varieties under both timely and late sown. Time of sowing decreased substantially almost in all the yield components measured viz. number of ear per plant, ear length, number of grains per plant, test weight, biological yield and harvest index which caused severe reduction in yield. Overall, T10 (Seed soaking in (0.75mM) salicylic acid + Foliar spray of (0.75mM) salicylic acid at 30 DAS) treatment showed best result and T2 Seed soaking in (0.25mM) salicylic acid gave least. Overall growth attributes physiological traits and yield as well as yield components of wheat crop were adversely affected by time of sowing due to onset of high temperature during crop growth and particularly grain filling. All the salicylic acid treatments reduced the detrimental effect of late sown on both the varieties by improving physiological traits which ultimately helped in attaining higher yield.

Keywords: Growth, conditions, yield and yield parameter

Introduction
In India, wheat production has been stagnant around 70-72 million tonnes since 1999-2000, to meet the increasing demand of the growing population till 2020, it is estimated that around 9 million tonnes wheat grain production will be required. It is consumed in the form of chapattis, puris, suji or rawa. Wheat grain has relatively high content of niacin and thiamine that's why wheat proteins are especially important in human diet. Beside their significance in nutrition they are principally concerned in providing the "gluten" which provides spongy cellular texture of bread and baked product. Wheat straw is good source of feed for a large population of cattle in our country.

There are number of constraints which affect wheat production and decrease the nutritive value of wheat. Among them increase in temperature due to global warming is an important factor. Most of the world crops including wheat have an optimal range of temperature. Exposure to higher than optimal temperature reduced yield and decreased quality of wheat grain. Over 7 million hectares of wheat grown in approximately 30 countries are subjected to continual heat stressing environment and adversely affects wheat growth in many important

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(6): 210-214
© 2021 TPI
www.thepharmajournal.com
Received: 01-04-2021
Accepted: 03-05-2021

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Subodh Kumar
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Srivastav
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Veterinary Pharmacology & Toxicology, College of Veterinary Science and Animal sciences, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author:
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of stocking density on gait score and mortality in broiler chickens

KD Singh, PS Pramanik, Subodh Kumar, Rajesh Kumar, AK Srivastav and MK Verma

Abstract
The research was conducted to investigate the impact of stocking density (i.e. I.C.A.R., Venky's and Amrit recommendations) on gait score & mortality in broiler chickens. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches. Each batch was subdivided in 3 equal groups namely Gr 1 (I.C.A.R.), Gr 2 (Venky's) and Gr 3 (Amrit). All the birds were reared on pucca floor with saw dust as litter material providing equal managemental practices. Walking ability was accessed at weekly interval up to 6 weeks of observation. The gait scoring system followed in the present study was Modified gait scoring system developed by Garner *et al.* (2002). Daily mortality of birds was recorded in morning hours &mortality rate was calculated weekly. The lowest and highest% of birds showing GS 0 under I.C.A.R. recommendation of stocking density have been found to be 85.35±0.64% (week 4) and 92.86±0.40% (week 6) respectively. Similarly the corresponding proportion of birds showing GS 1 were 6.07±0.78% (week 1) and 13.93±0.64% (week 4, respectively. Comparatively lesser % of birds show GS 2 and the lowest and highest L.S. means % of this were 0.00±0.40% (week 5) and 3.21±0.82% (week 3) respectively. Venky's & Amrit's observation were also similar as I.C.A.R. recommendation has been observed. Overall it has been observed that% of birds showing GS 1 was significantly more in I.C.A.R. followed by Amrit and Venky's during this study. However, highest% of birds showing GS 1 was recorded in Venky's recommendation followed by Amrit and I.C.A.R. Whereas, less than 5% birds exhibited GS 2 in this study in respective of stocking densities. There was no significant difference regarding% of birds with GS 2 in three stocking densities during all the weeks except at week 4. The overall mortality (%) was less than 5% over weeks under each placement densities. No significant difference was observed among mortality rates of broiler chickens under these three stocking densities during all the weeks studied. From present study, this can be concluded that leg health and walking ability was comparatively better under I.C.A.R. recommendation followed by Amrit and Venky's. However, effect of stocking density on mortality was non significant among three stocking.

Keywords: gait score, foot pad lesions, stocking density, mortality and walking ability

Introduction
The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012) [21]. Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.67 percent and 11.44 percent in egg and broiler production, respectively. The value of output from the poultry sector was US$10 billion in 2014 (Rajendran *et al.*, 2014) [25]. Broiler production has been more vibrant than layer production within the poultry sector, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (Index Mundi, 2015) [15]. India is the fourth largest producer of poultry meat in the world, valued at US$ 6.6 billion. Poultry production accounts for about 0.66 percent of India's GDP and 7.72 percent GDP from the livestock sector (Rajendran *et al.*, 2014) [25]. Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014. The per capita availability of poultry meat is 2.8 kg; against recommended level of 11 kg (Rajendran *et al.* 2014 [25]; Index Mundi, 2015 [15]). The main reasons for improved broiler poultry production (Kalamkar, 2012; SAPPLPP, 2009) [17, 29] are: modernization of production practices; import of pure lines/grandparent stock; least-cost feed formulation; vaccines against major diseases; provision of EAS and other input services; improved quality breeder management; developments in poultry processing; and private sector partnerships through Contract Broiler Farming. It is estimated that 37 percent of broiler production in India is under contracts, and about 78 percent of those contracts are concentrated in southern India (Rajapwani, 2012) [26].
Gait scores (GS), a parameter used to evaluate walking ability (Kestin *et al.*, 1992, Garner *et*

VOL. XXX, ISSUE XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

EFFECT OF *MORINGA OLEIFERA* LEAF EXTRACTS ON CARCASS CHARACTERISTICS AND MORTALITY OF BROILER CHICKENS

A. K. Verma[1], P. S. Pramanik[1], M. K. Verma[2], Jaswant Singh[2], Ruma Devi[3], A.K. Srivastav[2]andGaurav Panday[1]
[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya,
[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[3]Department of Livestock Product Technology, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
ajeetverma95@gmail.com

(MS Received: 25.07.2021; MS Revised: .29.08.2021; MS Accepted: 29.09.2021)
MS 2738 **(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT)**

Abstract

The present study was carried out to evaluate the influence of Moringa oleifera leaf extracts on carcass traits and mortality of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were; basal diet with no supplement (NC- negative control) and basal diet supplemented with antibiotics (PC-positive control), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE). Percent weight of various cut parts, eviscerated weight and drawn yield were evaluated after 35 days of experiment. The results showed significantly higher eviscerated weight and drawn yield percentage in Moringa extracts supplemented groups compared to PC group. PC and MOAQE group recorded significantly ($P<0.05$) higher drumstick % compared to NC, MOEE and MOALE group. Moringa extracts group recorded significantly ($P<0.05$) lower mortality than PCand NC group birds. From above results it was concluded that supplementation of Moringa extract of 1.5% Moringa oleifera leaf powder improved the carcass traits and reduced the mortality of birds.

Key words: *Broiler, Extract, Carcass, Mortality and Moringa (words in alphabetical order)*

Introduction

Major cost involved for poultry enterprise is in the form of feed. Various approaches such as feed supplements and additives are being used to obtain more net return and to minimize expenditure on feed (Agasheet *al.*, 2017). *Moringa oleifera* leaf (MOL) has fascinated great attention as a non-traditional feed component because of its unique qualities. Moringa oleiferagrows fast, drought-tolerant tree native belonging to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. Moringa is currently cultivatedglobally in the tropics and subtropics (Faheyet *al.*, 2001). Crude protein content in Moringa varies from 25% to more than 30% on a dry matter basis (Melesse et al., 2013), with a high proportion of essential amino acids (Lu *et al.*, 2016). Moringa leaves, flowers and Pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron and alpha-tocopherol (Dahot M.U., 1988). Moringa leaves are the preferred part of tree for use in animal diets as leaf meal due to high nutritional and medicinal properties (Abbas, 2013). The meat obtained from broiler chickens is an excellent source of protein, vitamins, mineralsand lower in fat content, so having a great demand among non-vegetarians(Naji *et al.*, 2013).Addition of*Moringa oleifera* leaf meal in broilers diet resulted significant increase in dressed weight, eviscerated weight and dressing percentage (Ayo-Ajasa *et al.* 2016). Dietary supplementation of Moringa leaves would be a potential strategy to improve the meat quality in broilers due to its antioxidant potential. It was further reported that phytosterols could lower malondialdehyde content and increase glutathione concentration in the breast muscle of broiler chickens (Naji *et al.*, 2013).

This study was carried out to evaluate the effect of different extracts (1.5%) of *Moringa oleifera* leaves powder as feed supplement in broiler diets on carcass characteristicsand mortality of broiler birds.

(Please correct red marks)

Materials and Methods

The present experiment was conducted after an approval from "Institutional animal ethical committee (IAEC)" was obtained vide reference number IAEC/CVSc/P-36/2019. A total of 250 one-day old Vencobb-430 strain chicks were randomly allocated into five dietary treatment groups with 5 replicates of 10 chicks in each. The chicks were kept on five dietary treatments which includes a basal diet without any additive in negative control (NC) or that supplemented with antibiotics (Positive control-PC), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE) in basal diet. Birds were fed *ad libitum* in different phases of experimental trial. The composition of formulated experimental diets as per BIS (2007) has been given in Table 1.

The chicks were kept on deep litter system under uniform standard management conditions with availability of clean, fresh and wholesome drinking water. Mortality was recorded during the entire research period. At the end of trial one bird per replicate (5 birds/treatment) were selected randomly for the carcass evaluation and sacrificed after 12 hours pre-slaughter fast though drinking of water was allowed. After complete bleeding carcass were dipped in hot water (58°C) for 1-2 minutes and feather were removed. Evisceration was done by making a slit from tip of breast bone up to the area around the cloaca. Thorough washing and cleaning were done after evisceration. After that the carcass were kept hanging on the special racks for 5-10 minutes. The visceral organs were removed by supporting the bird with one hand via the incised abdomen. Eviscerated carcasses were weighed and cut parts like thigh, drumstick, breast, wings, back, head, neck and shank were also weighed.The relative weight of dressed, drawn yield and different edible cuts were calculated as percentage of live weight.

The data were analysed under completely randomized (CRD) by employing one way analysis of variance (Snedecor and Cocran, 1994) and means of different dietary treatments were compared with Duncan multiple range test. The P value lower than 0.05 was thought-out significant.

(Please correct red marks)

Results and Discussion

Carcass characteristics:

The data pertaining to the carcass traits of broilers presented in Table 2. The results showed that the dressed weight and thigh weight of different groups was similar and showed no significan ($P>0.05$) effect of various Moringa extracts. The eviscerated weightof aqueous extract (72.24), ether extract (73.10) and alcoholic extract (73.09) supplemented group broilers were simila to NC (72.05) group, however significantly ($P<0.05$) higher than PC (70.39). The drawn yield of MOAQE, MOEE, MOALE and NC also significantly ($P<0.05$) higher than PC group. Leg and drumstick weight % of PC group was significantly ($P<0.05$) highe than MOEE and MOALE group. However, leg weight wa

International Journal of Plant & Soil Science

34(1): 63-70, 2022; Article no.IJPSS.81077
ISSN: 2320-7035

Effect of Land Configuration and Moisture Regimes on Productivity of Hybrid Maize (*Zea mays* L.) in Summer Season

Vishuddha Nand [a*], Vinay Kumar Patel [b] and Ashish Kumar Srivastav [a]

[a] Department of LFC, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.
[b] Department of Agronomy, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i130825

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/81077

Original Research Article

Received 17 November 2021
Accepted 20 January 2022
Published 25 January 2022

ABSTRACT

An experiment was conducted on "Effect of land configuration and moisture regimes on productivity of hybrid maize (*Zea mays* L.) in summer season." during 2018-19 at Agronomy Research Farm, ANDUA and T, Kumarganj, Ayodhya (U.P.). The experiment accomplished of 12 treatment combinations and laid out in split plot design, replicated three times. The Experiment consisted of three land configuration *viz.* flat bed planting (P_1), ridge planting (P_2) and paired row planting on raised bed (P_3) were kept in main plots and four moisture regimes *viz.*0.5 IW/CPE ratio, 0.7 IW/CPE ratios, 0.9 IW/CPE ratios and 1.1 IW/CPE ratios were allotted in sub plots. The experimental results revealed that growth parameters, such as plant height, leaf area index, dry matter accumulation, days to 50 percent ear emergence and days to50 percent maturity and yield were obtained maximum with the paired row planting methods followed by ridge planting and flat bed planting and yield attributes such as number of cobs plant^{-1} , number grains row^{-1}, number of grains cob^{-1}, cob length (cm), cob girth (cm), grains weight cob^{-1}(g), cob weight (g), shelling percentage (%), grain yield (q ha^{-1}), stover yield (q ha^{-1}), and biological yield (q ha^{-1}) were also increased similarity in same treatment. In case of moisture regimes, the same trends were observed maximum when applied irrigation at 1.1 IW/CPE ratios as compared to other moisture regimes.

**Corresponding author: E-mail: vishuddhanand84nd@gmail.com;*

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[1],Gaurav Panday[1], A.K.Srivastav[5] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.

College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) con of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly high weight, lower feed intake and better FCR($P<0.05$). The body weight of chicks raised under sand and rice hull litter did n significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand li performance index of the earlier study period was significantly higher in paddy straw + rice hulls followed by sand and ri respectively.

Key words: *Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Srechari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth perf of kadaknath fowls

To study the feed conversion efficiency of kadaknath fow various bedding materials

Materials and Methods:

The present investigation was carried out to study the different litter materials on growth performance, feed gain Kadaknath fowl. The study was carried out at the poultry Teaching Livestock and Poultry farm of the College of V science and Animal Husbandry, N.D.U.A.T. Kumarganj, U.P., situated at a distance of 42 km away from Faizabad cit km away from Jagdishpur Industrial area at an altitude o above sea level and latitude of 26° 47' North and longitude East and it falls in Eastern plain Zone of Middle Gange region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of Nove February which comprised winter season of this region. Du period, the climatic parameters have been shown in table average minimum temperature recorded during study per 12.54°C, while the average maximum temperature was There were a few showers of rain, ranging from 62 to 123 average was 92.5 cm during this period. The topography o almost even and most of the farm area remains dry round Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding an of Kadaknath Chicks in the brooder house. Brooding was pukka floor using deep litter system. Each group of Kadakna placed in separate pens which were visually isolated from e along with provision of adequate ventilation and artificial lig brooder house.

Preparation of brooder house to receive Kadaknath chicl

Brooder house was properly scrubbed and cleaned at leas before the trail began. After the house, equipments were cleaned. The house was allowed to dry out thoroughly. The h equipments were fumigated using 1% formalin. Three inches litter were made on the floor. Few days before the chicks equipments were arranged in brooder house and the elect were started to adjust temperature and light. The temperatu the brooder house was slightly above 35°C. The corners of space were made rounded off with cardboard and metal chi to prevent chicks from piling up in the corner. All these pre

...Refereed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[2], Vishuddha Nand[2] and A.K. Srivastav[2]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N:L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tremadol (T_T) and lignocaine+tremadol (T_{L-T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study, The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because hornless cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Gooneewardene and Hand, 1991; Faulkner and Weary, 2000; Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with researched methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978), The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Bengtsson *et al.* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al.* 1999). The Council of Europe recommends the use of anesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L-T}). Medication was done 5-10 minutes before disbudding. Two doses of ligocaine per bud were injected for cornual nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (^{0}F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 254-258

Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Gupta
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

RS Yadav
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

KD Singh
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

AK Srivastav
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

Vishuddha Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK Srivastav

Abstract
An experiment was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The experiment comprised of twelve treatments *viz.* T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), T_3 (100% N through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF +50% N through FYM), T_6 (50% RDF +50% N through Poultry Manure), T_7 (50% N through FYM+50% N through Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T_9 (75% RDF +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure), T_{11} (25% RDF +75% N through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in Randomized Block Design with three replications. the results revealed that the maximum plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of nodules $plant^{-1}$ were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) fallowed by 75% RDF +25% N through poultry manure and 75% RDF +25% N through FYM.

Keywords: FYM, Poultry manure, INM, growth, RDF, plant height, and leaf

Introduction
Berseem (*Trifoliumalexandrinum* L.) is one of the most important winter forage crop of India, due to high forage yield, palatability and nutritive value. It has become a very popular as *rabi* forage in irrigated areas or all most all over the country. Berseem belongs to one of the largest and most useful plant family leguminaceae and sub family faboideae. Berseem is known as king of fodder crops and it is popular among the world. It is one of the oldest cultivated crops, domesticated in Egypt and later introduced into many other parts of the world. Berseem was introduced in India in 1903 (Roy *et al.*, 2009) [5]. It is now widespread in the irrigated regions of west and south Asia. Most of the farmers conserved the berseem as hay to get cheap, palatable and nutritive forage during scarcity periods or early winter and summer. Berseem is a cheapest source of increasing milk production as well as improving soil fertility. Berseem can be sown in early autumn and can thus provide feed before and during the colder months but the optimum conditions are 18-25 °C. If the winter temperature falls to 6-8° C the crop growth is severely affected. This is nutritious, succulent and palatable fodder available for fairly long period during winter, spring and early summer (Chaterjee and Das, 1989) [2]. Grazing is possible though less common than cutting. The most important cultural practices that need to be carefully adjusted to achieve maximum benefit from the forage grass-legume mixtures. The ability to fix atmospheric nitrogen and convert it to a useable form for plant growth is the main trait to these legumes (Allen and Allen, 1981) [1].
Poultry manure is an excellent soil amendment that provides nutrients for growing crops and also improves soil quality when applied widely, because it has high organic matter content combined with available nutrients for plant growth (Ryssen *et al.*, 1993) [7]. The application of FYM with chemical fertilizers and composted with rock phosphate to improve crops yield is very well established (Shafi *et al.*, 2012) [8]. Fertilizers play an important role in enhancing forage productivity. Chemical fertilizers are soluble and immediately available to the plants; therefore, the effect is usually direct and fast, the price is lower and they are quite high in

GENETIC STUDIES ON REPRODUCTIVE TRAITS OF HARIANA COWS

***Ashish Kumar Srivastava, Jaswant Singh and V.K. Singh**
*Assistant Professor, Department of LFC
College of Veterinary Sciences and Animal Husbandry
N.D.U.A.T., Kumarganj- Faizabad (U.P.)

Abstract

performance records of 211 Hariana cows, progeny of 27 sires, born during the year 1966 to 1985 having at least records up to second ing were utilized in this study. These cows were maintained at D.D.D. farm, Mathura and livestock farm, Madhurikund (Mathura). The 'age post partum oestrus interval was estimated to be 185.43± 11.18, the heritability estimate of post partum oestrus interval was estimated e 0.021±0.175. The magnitude of the effect of sires was non significant and the variation in post partum oestrus accounted due to sires very small (8.7%) in total variation. The least squares means and their standard errors of number of service per conception were estimated e 2.19±0.26. The heritability estimate of the number of service per conception was estimated to be 0.294±0.210. The contribution of sires 21.8% in the total variation of the trait.

roduction

cow is an efficient machine for converting farm crops into useful nan food like milk and milk products, which are the main source of mal protein in the diet of a large vegetarian population of the ntry. Hariana breed of zebu cattle has been well established dual-pose breed known for its milk yield as well as for draught ability. e breed has reduced significantly and is continuing to decline at an rming rate. Apart from the declining population, Hariana cattle ve also deteriorated in their productivity (Joshi et al., 1995).

aterials and Methods

e present study was undertaken on Hariana cows. All the animals ten into consideration were farm bred. The data used in this vestigation were collected from the pedigree sheets, milking register d breeding record of Hariana cows maintained at DDD Farm, athura. The performance record of 211 cows, having at least record to second calving were collected for genetic studies. The statistical alysis of the data was carried out by using the LSMLMW (Least quares and Maximum Likelihood Method)- Harvey (1990) PC-2 rsion computer programme and Henderson (1953) model were used.

esults and Discussion

ne least squares mean of the post-partum oestrus interval along with eir standard errors have been presented in table 1. The average post-rtum interval was estimated to be 185.43±11.18 days. The equency of animal in various PPO groups (class interval of 40 days) about 23.69% animals had post-partum oestrus interval below 90 ys. The maximum frequency of animals was in 90 to 130 days group 6.54%). Present observation is comparatively higher than the verage of post-partum interval reported by Luktuke and ubramanium (1961), Singh et al., (1964), Arora et al., (1971), charya et al. (1971) and Khanna (1998) for Hariana cows. Whereas, ohli and Suri, 1957, Kohli and Suri, 1960 and Tomar and Arneja, 972 have reported comparatively higher post-partum oestrus in lariana cattle.

east squares analysis of variance was performed to study the effect f farm, period and session of calving are present in table 2. The erusal of the table revealed that the effect of farm was found to be on-significant on post-partum oestrus interval in Hariana cows, lthough the contribution of farm was highest (83.5%) in total ariation. However, Ashraf et al., (2000) observed highly significant arm effect on post-partum oestrus interval. The effect of period and eason of calving were found non-significant. However, Mahmoud et l., (1991) observed a significant effect of month of calving.

Heritability estimate of post-partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non-significant and the variation in PPO accounted for due to sires was very small (8.7%) in total variation. The findings were indicative of zero heritability for this trait in these animals. Similar observations were reported by Prasad (1958) for Tharparkar cattle and Singh et al., (1964) for Hariana cattle.

Conclusion

Any selection programme based on post-partum oestrus interval will not prove beneficial in these cattle because the genetic variability for this character in these animals does not seem to exist. In view of the above observations, improvement in managemental practices may lead improvement in this trait.

References

Acaraya, R.M.; Dhillon, J.S. and Agrawal, S.C. (1971). A note on the factors affecting post-partum oestrus interval in Hariana cattle. Indian J. Anim. Sci. 41 (7) : 524-525.

Arora, K.L.; Tomar, S.S. and Singal, S.P. (1971) Factor effectin the reproductive efficiency of Hariana cattle the duration of post-partum breeding interval. The Indian Veterinary Journal 48: 1015-1019.

Joshi, B.K.; Tantia, M.S.; Kumar, P.; Gupta, Neelam; Vij, P.K.; Nivsarkar, A.E. and Sahai, R. (1995). Hariana cattle a monograph on breed characterstics. NBAGR Research Bulletin No (3), NBAGR P.B. 129, Karnal-132001, India.

Khanna, Neetu (1998). Studies on certain aspects of reproductive performance in Hariana and crossbred cattle. M.V.Sc. thesis in Vet. Obstetrics and Gynaecology submitted to C.S. Azad Univ. of Agri. And Tech. Kanpur.

Kohli, M.L. and Suri, K.R.; (1960). Longevity and Reproductivity in Hariana cattle. Indian J. of Veterinary Sci. and A.H. 27 (1): 105-110.

Luktuke, S.N. and Subramanium, P.; (1961). Studies on certain aspects of oestrus phenomenon in Hariana cattle. J.Reprod. Fert. 2: 199-200.

Singh, O.N.; Prasad, J.N. and Prasad I.B. (1964). Conception rate of Hariana and Bachur cows under artificial breeding condition in the farm. Indian Vet. J. 41: 513-520.

Tomar, N.S.; Srivastava, K.N. and Singh B.P. (1976). Heritability estimates of fertility of Hariana heifers and their age at first calving. Indian J. Ani. Health. June: 63-66.

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

ASSOCIATIONS AMONG BODY CONDITION SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

Vikas Singh[1], V. K. Singh[2], P. S. Parmanik[1], A.K.Verma[1] and A.K.Srivastav[3]
[1]Department of Livestock Production Management
[2]Department of Animal nutrition
[3]Department of L.F.C
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract
To assess the associations among body condition score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of dairy cows, 50 cows (HF cross) at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<3.0, thin), group II (3.0<BCS>3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly (P<0.05) higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score (SCS) was correlated negatively with BCSC and positively with BCSL.
Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

Milk quality is as significant as the milk quantity in dairy animals. High yielding dairy cows had higher incidence of mastitis that can be assessed by somatic cell count (SCC) of milk (Kadarmideen and Bryce, 2001). Optimal body condition of dairy cow is important for obtaining elite herd and quality milk. Low or higher body reserves may pose a risk of lower milk yield and higher SCC in milk respectively (Berry et al., 2007). High yielding dairy cows exhibit negative energy balance after calving which may influence both immune and metabolic system of the individual that predispose the animals to mastitis. Body condition score had a favourable correlation with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. Hence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), Production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). The SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as SCS=$\log_{10}$SCC (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly (P<0.05) among the three groups of cows. The BCS during calving to 15 days were significantly (P<0.05) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al*., 2000, Friggens *et al*.,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3≤BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
0	2.83^{c}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
0	2.63^{b}±0.12	2.82^{bB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
0	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
0	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
20	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: (P<0.05)
Values with different superscripts capital letter in a column differ significantly: (P<0.05)

VOL. VIII, ISSUE SPECIAL(C) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1] , P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2],Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly higher body weight, lower feed intake and better FCR($P< 0.05$). The body weight of chicks raised under sand and rice hull litter did not differ significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand litter. The performance index of the earlier study period was significantly higher in paddy straw+ rice hulls followed by sand and rice hulls respectively.

***Key words**: Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials. 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth performance of kadaknath fowls

To study the feed conversion efficiency of kadaknath fowls under various bedding materials

Materials and Methods:

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26^0 47' North and longitude of 82^0 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. During this period, the climatic parameters have been shown in table 3.1. The average minimum temperature recorded during study period was 12.54^0C, while the average maximum temperature was 24.86^0C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 cm during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(^{0}C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches: each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35^0C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations

ASSOCIATIONS AMONG BODY CONDITION SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

Vikas Singh[1], V. K. Singh[2], P. S. Parmanik[1], A.K.Verma[1] and A.K.Srivastav[3]
[1]Department of Livestock Production Management
[2]Department of Animal nutrition
[3]Department of L.F.C
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

To assess the associations among body condition score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of dairy cows, 50 cows (HF cross) at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<3.0, thin), group II (3.0<BCS>3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly (P<0.05) higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score (SCS) was correlated negatively with BCSC and positively with BCSL.

Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

Milk quality is as significant as the milk quantity in dairy animals. High yielding dairy cows had higher incidence of mastitis that can be assessed by somatic cell count (SCC) of milk (Kadarmideen and Pryce, 2001). Optimal body condition of dairy cow is important for obtaining elite herd and quality milk. Low or higher body reserves may pose a risk of lower milk yield and higher SCC in milk respectively (Berry et al., 2007). High yielding dairy cows exhibit negative energy balance after calving which may influence both immune and metabolic system of the individual that predispose the animals to mastitis. Body condition score had a favourable correlation with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. Hence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), Production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). Th e SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as SCS=$\log_{10}$SCC (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly (P<0.05) among the three groups of cows. The BCS during calving to 15 days were significantly (P<0.05) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al.*, 2000, Friggens *et al.*,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3≤BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
00	2.83^{c}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
30	2.63^{b}±0.12	2.82^{bB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
60	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
90	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
120	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: (P<0.05)
Values with different superscripts capital letter in a column differ significantly: (P<0.05)

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF DIFFERENT LITTER MATERIALS ON BEHAVIOR OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

The present study was conducted to investigate the effect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were seemed to be significantly differed in morning, noon and evening hour interval.

Key words: Kadaknath, feed, behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007). Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26^0 47' North and longitude of 82^0 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54^{0}C, while the average maximum temperature was 24.86^{0}C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 cm during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35^{0}C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivnathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

VOL. VIII, SPECIAL ISSUE (B) AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY ON DIFFERENT LACTATION CURVE MODELS ON TEST DAY MILK YIELD IN MURRAH BUFFALO

S. P. Mishra, V.K. Singh, M. K. Verma,* J. Singh, A. K. Verma[1] and Chandra Prakash[2]
Department of Animal Genetics & Breeding, [1]Department of LFC, C. V. Sc. & A. H.,
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, U.P.
[2]Division of Animal Genetics, IVRI, Izatnagar, Uttar Pradesh
*Corresponding Author: manojvet550@gmail.com

ABSTRACT

The present study was carried out on 172 lactation records of Murrah buffalo maintained at Livestock farm, NDUAT, Kumarganj, Faizabad under Network Project on Buffalo Improvement (AICRP) from 2002-2011. The four weekly test day milk yield were used to develop the best lactation curve for the 305 days lactation milk yield in Murrah buffaloes using four models viz. Gamma type function (Wood, 1967), Exponential function (Wilmink, 1987) and Quadratic model (Dave, 1971). The average weekly test day milk yield increased from 7.11 kg in 1st week to a peak yield of 9.91 kg in 8th week, and subsequently to 4.17 kg in 40th week according to Exponential function for overall records. The average weekly test day milk yield increased from 8.77 kg in 1st week to a peak yield of 11.55 kg in 8th week, and subsequently to 5.81 kg in 40th week as per Quadratic model for overall records. The gamma type function was observed slightly higher test day yield in first lactation than the least squares mean. However it was observed lower value in other lactations than the least square mean. The different lactation curve of lactation wise showed gamma function type gave the best fit results in all the lactations.

Key Words: *Lactation curve, Four weekly test day milk yield, ascending phase and descending phase.*

Introduction: There is different trends of milk secretion throughout the lactation of an animal, which can be invariably represented mathematically in the form of the lactation curve. In simple term the lactation curve can be defined as the graphical representation of milk yield against the time (Broody *et. al.*, 1923). There are three different stages of lactation curve. The ascending phase indicates the initial steep rise in the milk yield, which is usually linear. The peak yield along with persistent phase is the largest phase of the lactation, which represent the inherent capacity of animal for suitable milk production. The third phase is the decline phase, which is comparatively short. This phase is usually associated with the drying off stage of the animal. Various lactation curve models have been tried by different workers to fit the lactation curve in different cattle breeds (Singh *et. al.*, 2002; Cilek and Keskin, 2008; Rashia, 2010). The three models (Gamma function, Exponential Function and Quadratic function model) have been used for modeling of lactation curve in present study. The lactation curve models are also used to predict the yield of lactation at any point of the lactation. This property of the model can prove beneficial in case of incomplete records. Getting the test day information from field is not easy and there is every chance of missing the data due to certain inevitable reasons. In such cases these lactation models may prove very beneficial for prediction of these incomplete records. Lactation curve is a valuable tool in designing suitable breeding and managemental strategies for lactating animals. Hence, the present study is carried out on the four weekly test day milk yield data of Murrah buffalo maintained at NDUAT, Kumarganj, Faizabad under Network Project on Buffalo Improvement (AICRP) with objective to identify the best fit lactation curve model to test day milk yield data of Murrah buffalo.

Material and Method: the data utilized in present study was spread over a period of nearly 10 years from 2002 to 2011. The data of 172 four weekly test day milk yield (1st weekly test day milk yield-WTDY 1; 4th weekly test day milk yield-WTDY 2; 8th weekly test day milk yield-WTDY 3; 12th weekly test day milk yield-WTDY 4; 16th weekly test day milk yield-WTDY 5; 20th weekly test day milk yield-WTDY 6; 24th weekly test day milk yield-WTDY 7; 28th weekly test day milk yield-WTDY 8; 32th weekly test day milk yield-WTDY 9; 36th weekly test day milk yield-WTDY 10 and 40th weekly test day milk yield-WTDY 11) distributed in different parities as given as first lactation (44 records), 2nd lactation (29), 3rd lactation (34), 4th lactation (32) and 5th lactation (32). Selection of models were selected and fitted to the lactation curves for the five parities to determine the best model for each of the parity. The models used were as follows-

1. Gamma function model - Model 1 (Wood, 1967)
   $Yt = at^b e^{-ct}$
2. Exponential Function model –Model 2 (Wilmink, 1987)
   $Yt = a + bt + c\exp^{(-0.05t)}$
3. Quadratic model –Model 3 (Dave 1971)
   $Yt = a + bt + ct^2$

   Where,
   Yt = average test day milk yield in the tth week
   a = appropriate initial milk yield just after calving
   b = incline slope parameter upto peak yield
   c = decline slope parameter
   t = time of test day yield

the above mentioned models were fitted to milk yield for different parities. The most suitable model for different parities was identified on the basis of highest coefficient of determinant (R^2) value.

Result and Discussion: the 172 WTDY of different lactation were used to predict different WTDY by these above mentioned lactation curve models. The results are presented in table 2 for different lactation. The average four weekly test day milk yield increased from 6.17 Kg in 1st week (WTDY 1) to a peak yield of 8.91 Kg in 8th week (WTDY 3) and subsequently to 3.30 Kg in 40th week (WTDY 11) by Gamma function model (Model 1). The average four weekly test day milk yield increased from 7.11 Kg in 1st week (WTDY 1) to a peak yield of 9.91 Kg in 8th week (WTDY 3) and subsequently to 4.17 Kg in 40th week (WTDY 11) by Exponential function model (Model 2). The average four weekly test day milk yield increased from 8.77 Kg in 1st week (WTDY 1) to a peak yield of 11.55 Kg in 8th week (WTDY 3) and subsequently to 5.81 Kg in 40th week (WTDY 11) by Quadratic model (Model 3) for overall records presented in table 1.

The Gamma function (Model 1) was observed slightly higher WTDY in first lactation as compare to the least squares mean of actual observations. However it was observerd lower value in all other lactations than the least squares mean of actual observations. Quadratic model (Model 3) gave the highest value in all the lactation than the least square mean of actual observations. The Gamma function (Model 1) gave the best fit results in all the lactation with higher R^2 value. Similaraly Dongare *et. al.*, 2012, Cilek, and Keskin., 2008, singh and bhat., 1978, pande, 1983, olori *et. al.*, 1999, Yadav *et. al.*, 1977 and Kellong *et. al.*, 1977 found good fit Model l in different breeds of

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 62-64
© 2020 JEZS
Received: 11-01-2020
Accepted: 13-02-2020

P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production & Management, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Animal Genetics and Breeding, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, C.V.Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Verma
Department of Livestock Farm Complex, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Gupta
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

B Singh
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens

P Gautam, PS Pramanik, KD Singh, MK Verma, S Gautam, AK Verma, VN Gupta and B Singh

Abstract
The present experiment was conducted to investigate the impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens. For a period of 42 days study two hundred forty day old Vencobb 400 straight run commercial broiler chicks were randomly divided into three groups with 2 replicates of 40 in each at the poultry unit of livestock farm complex, College of veterinary sciences and animal husbandry, A.N.D.U.A.T. Kumarganj, Ayodhya, (U.P). In first green-blue group (T_{GB}), the birds were kept on green LED light (GL) and blue LED light (BL) from 1-21days and 22-42 days, respectively. The broiler birds of Group Tw and Tc were kept in white and incandescent LED lights for 42 days, respectively. The findings revealed that the heterophil % differed significantly ($P<0.05$) at 6th week of age when broiler finished their light treatment duration (after shifting from green LED to blue LED at 4th week of age). The ratio of blood heterophil to lymphocyte was also significantly differed ($P<0.05$) at the 6th week of age. The H/L ratio was higher in T_C group (0.37±0.008) whereas, it was lowest in T_{GB} group (0.33±0.456) than Tw group (0.35±0.120) birds at 6th of age. This study indicated that birds were minimum stress level in T_{GB} group than other treatment groups. The mortality rate of broiler chicks was highest in Tw group (6.25%) and lowest in T_{GB} group (3.75%) than T_C group (5%) birds. The results of the present study concluded that, broiler birds under green-blue (1-21d in GL and 22-42d in BL) LED bulb treatment group had significantly ($p<0.05$) lower stress as drawn by a ratio of Heterophil: Lymphocyte, which was highest in incandescent bulb treatment groups followed by white LED groups.

Keywords: Monochromatic light, stress reaction, mortality rate, broiler chicken

Introduction
For the large section of poultry meat consumers, the comprehensive mechanization of the poultry segment has made the broiler meat available in the recent years. Now the broiler meat is far most globally famous animal food product due to its nutritional, sensory and economical properties. It has a high potential to generate foreign exchange earnings through export of poultry products to neighboring countries. The Poultry industry has emerged as the fastest growing segment of the livestock sector both globally as well as in India (Iisa Augustine and Ruchira Shukla, 2015) [6]. Broiler production is one of the most dynamic and fastest growing animal husbandry sub-sectors in India. The total poultry population has increased by 16.81% over in the recent census and the total poultry in the country is 851.81 million. However, in previous census 2012, it was 729.21 million in numbers (Livestock census, 2019) [14]. Due to increasing population growth, urbanization and rising income there is an increasing demand of animal protein source so that chicken meat has shown its fastest growth in last two decades.
Lighting is an important environmental cause in poultry production that is known to affect performance and behavior. Chickens are visually well equipped, and therefore light plays very important role in their wellbeing and productivity. Light is constituted of a wide spectrum of electromagnet (EM) waves. The visible part of the electromagnetic (EM) spectrum is relatively small and is formed of wavelengths from approximately 350 to 800 nm. The eyes of broilers seem to be more sensitive to the broader spectrum than humans and these can perceive ultraviolet and infrared as well.

Components of Light in Poultry Management
Artificial light can be described by distribution of light (photoperiod), colour (wave length)

EFFECT OF NEEM LEAVES FEEDING ON SERUM BIOCHEMICAL PARAMETERS OF COMMERCIAL BROILER CHICKENS

Gaurav Panday[1], P S Pramanik[2], P K Chaudhary[3], Amit Tiwari[4] A K Verma[5], K D Singh[5], Jaswant Singh[6], Mukesh Kumar[7]

College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad.

1.PhD Scholar department of Livestock Production Management, 2.Professor department of Livestock Production Management, 3.Assistant Professor Department of Veterinary Physiology and Biochemistry, 4. MVSc Scholar Department of ANN 5.Assistant Professor Department of ILFC, 6. Assistant Professor Department of AGB, 7.Assistant Professor Department of VAN

Abstract

The experiment was conducted at the nearby poultry farm of the College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, UP, India. A total of 200 unsexed Vencob commercial broiler chicks were distributed to four treatment groups each made of 50 chicks in a 4-brooder rooms. All the fifty chicks from each treatment were divided to form 5 replicates of 10 chicks each in a Completely Randomized Design (CRD).The four treatment groups were supplemented with neem leaf powder @ 0g, 1g, 2g and 3g / kg of broiler ration respectively. The glucose levels in serum of different broiler groups were affected by NLP feeding and were ranged from 12.91 to 17.55 (mmol/l) and there was significant differences found in all the groups. The lowest glucose level was observed in T_2, followed by T_1, T_3 and T_0. The mean serum total protein concentration was significantly higher in T_2 followed by T_0, T_1 and T_3. The values of albumin in T_2 and T_3 were significantly lower than those of T_0 and T_1. Among the groups, globulin was ranged between 23.55 and 31.81 g/l. The Highest globulin value was recorded in T_2 followed by T_0, T_1 and T_3. The data of albumin: globulin ratio revealed that T_2 group birds had the lowest ratio among the groups. The serum cholesterol concentrations of all the treated groups were non-significant but significantly ($p<0.05$) lower than that of control group. The ALT level in T_2 group was significantly lower than that of other groups. The AST concentration in the different groups of broilers serum was ranged between 126.31 and 134.79 U/L and the T_2 group showed significantly lower AST value than that of other groups. There was significant difference observed in various serological parameters studied in different group of birds.

Key words- ALT, AST, Cholestrol, Serum and Neem leaf powde

Introduction

Many synthetic drugs and growth promoters are supplemented to the broilers for their rapid growth but their uses have shown many disadvantages like high cost, adverse side effect on health of birds and long residual properties (Nayaka *et al.*, 2012). Exploring new antibiotics and growth promoters from the medicinal plants is a priority in this era of antibiotics resistance to increase the production of broilers. Consequently, there is considerable research interest in the possible use of natural products such as essential oils, extracts of edible plants, herbs and spices, for the development of new additives in animal feeding. Scientists are concentrating on the use of our ancient medicinal system to find beneficial herbs and plants which can be safely used to increase the production of animals. Many plants such as garlic, cloves, neem fruits and leaves, cinnamon, ginger, peppermint, thyme, mustard, and fenugreek etc. produce secondary metabolites such as phenolic compounds, essential oils and sarasaponins. Blood profiles are important indices of the physiological state of animal. The serum biochemical and hematological features have attracted many workers to look at their indices in order to make clinical predictions of the health status of a particular animal or a bird. The blood picture varies with certain conditions such as stress, infectious and toxicity (Khan and Zafar, 2005). Blood constituents provide valuable media for clinical investigations and nutritional evaluations of an animal (Aderemi, 2004).

Materials and Methods

To carry out the present investigation, 200-day old straight run, commercial broiler strain "VENCOB" chicks were procured from a commercial hatchery. These 200 chicks were divided in four groups, i.e. Group 1, 2, 3, 4, each group having 50 chicks. All the chicks from each group were divided equally to form 5 replicates of 10 chicks each in a completely randomized design (CRD). Water and starter diet for the four respective treatments were offered *ad libitum*. The four treatment groups were supplemented with neem leaf powder @ 0g, 1g, 2g and 3g/kg of broiler ration respectively. The litter of each treatment group was mixed weekly with dry neem leaves @ 0g, 2g, 4g and 6g/sq. ft. area.

Feeding schedule and treatments

Just after arrival of chicks, glucose water @ 10g /l water was provided in each group of birds. *Ad-lib* feeding of pre-starter, starter, and finisher ration of commercial feed was provided according to their age. Feed was provided in morning, afternoon and night hours in each group after proper weighing. Proper medication was done each and every sick bird as per their need. Prophylactic treatment and supportive therapy was done in each group equally. Fresh and clean palatable drinking water was provided *ad-lib* in each group. Vitamin and other medicines were provided in the drinking water as per dose rate recommended.

Blood collection and analysis

Blood samples were collected from individual bird at the end of experiment and analysed for various serum biochemical parameters.

Collection and processing of blood samples

Blood samples were collected aseptically from wing vein of each bird using sterilized disposable syringe and placed in two sets of sterile glass tubes, first set with anticoagulant, ethylene diamine tetra acetate (EDTA) (@1 mg/ ml of blood) for haematological purposes and second set without anticoagulant for serum separation. Separate the clot from the inner surface of the tubes and centrifuge at 2500 rpm for 10 minutes and collected the supernatant serum. Then serum samples were stored in labelled vials at-20°C for further analysis to assess the biochemical profile of birds.

Biochemical profiles

Serum Glucose

Glucose in the serum was determined by o-toluidine method (Hultman, 1959), where glucose forms a green coloured complex with o-toluidine in hot acetic acid, the intensity of which is read photo metrically at 630nm.

Total protein

Total protein in serum was estimated by the biuret method (Hiller *et al., 1948*).

Proteins bind with copper ions in the alkaline medium of the biuret reagent and produce a purple coloured complex, whose absorbance is proportional to the protein concentration when read at 555 nm.

Albumin and globulin

Albumin in the serum was estimated by bromocresol green (BCG) dye binding method of Gustafsson (1976). Albumin in a buffered medium bind with bromocresol green and produces a green coloured complex whose absorbance is proportional to the albumin concentration, when read sprectrophotometrically at 630 nm. Globulin was determined as the difference between total protein and albumin concentration in the serum.

Total cholesterol

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1389-1393

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1389-1393
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Dry Neem Leaves (DNL) in the Reduction of Ammonia, pH and Moisture Level of Poultry Litter and its Effect on the Broiler Performance

Gaurav Panday[1*], P.S. Pramanik[1], Dharmesh Tewari[2], Mukesh Kumar[3], A.K. Verma[4] and S.V. Singh[5]

[1]Department of Livestock Production Management, [2]Department of Animal Nutrition, [3]Department of Veterinary Anatomy, [4]ILFC, [5]Department of Veterinary Clinical Medicine, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, India
**Corresponding author*

Keywords

Neem leaf powder, pH, Nitrogen, Moisture, Litter, Performance Index

ABSTRACT

The experiment was conducted at the nearby poultry farm of the College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, UP, India. A total of 200 unsexed Vencob commercial broiler chicks were distributed to four treatment groups each made of 50 chicks in a 4-brooder rooms. All the fifty chicks from each treatment were divided to form 5 replicates of 10 chicks each in a Completely Randomized Design (CRD). Drinking water and broiler diet for the four respective treatments were offered ad libitum. The litter of each treatment group was mixed weekly with dry neem leaves @ 0g, 2g, 4g and 6g / sqft area. The nitrogen%, moisture% and pH of litter from each treatment groups were analyzed to determine quality of litter at the end of experiment. The performance index was calculated at 7th, 21st and 42nd day. The application of 4g dry neem leaves in the poultry litter significantly ($p<0.05$) reduced the values of pH, moisture % and nitrogen % than those of other treatment and control group of birds. The highest PI value was obtained in the birds of T_2 group followed by T_0, T_1 and T_3 in a descending manner at 42nd day.

Introduction

There is a saying "As the litter goes, so goes the flock!" This saying has a lot of truth as it relates to managing litter and the subsequent effect it has on air quality. For the most part, litter management has often more to do with managing the systems that influence litter quality rather than managing the litter. Litter conditions are often a reflection of how well one has done in managing litter. So, the litter management is very important in case of poultry because bad litter can create a lot of problems. Improper litter management leads to NH3 gas accumulation in the poultry shed. NH3 is a toxic, color, odorous and corrosive gas which pollutes the air. In addition, it creates few diseases such as conjunctivitis, immune suppression, lung congestation, impaired kidney function leading to problems like nephritis & urolithiasis. Neem (*Azadirachta indica*) a large evergreen fast growing perennial tree, is native to India and inhabitant of South Asian countries. Among the all plant parts the processed leaves play the most significant role inlivestock health (Sharma and Reddy. 2002). Neem leaves have some medicinal properties like antibacterial, antifungal, antimalarial, antiviral, anti

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(4): 778-780
© 2018 TPI
www.thepharmajournal.com
Received: 15-02-2018
Accepted: 17-03-2018

Gaurav Panday
PhD Scholar Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

PS Pramanik
Professor Dept. of Livestock Production Management, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

AK Verma
Assistant Professor Department of ILFC, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Mukesh Kumar
Assistant Professor Department of Veterinary Anatomy, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Amit Tiwari
MVSc Scholar Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Abhishek Mishra
MVSc Scholar Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Awadhesh Kumar Yadav
MVSc Scholar Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Vijay Gautam
MVSc Scholar, Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Gaurav Panday
PhD Scholar Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Effects of Neem leaves powder supplementation on performance and water intake of broiler chicken

Gaurav Panday, PS Pramanik, AK Verma, Mukesh Kumar, Amit Tiwari, Abhishek Mishra, Awadhesh Kumar Yadav and Vijay Gautam

Abstract
To carry out the present investigation, 200 day old straight run, commercial broiler strain "VENCOB" chicks were procured from a commercial hatchery. These 200 chicks were divided in four groups, i.e. Group 1, 2, 3, 4, each group having 50 chicks. All the chicks from each group were divided equally to form 5 replicates of 10 chicks each in a completely randomized design (CRD).Water and starter diet for the four respective treatments were offered *ad libitum*. The four treatment groups were supplemented with neem leaf powder @ 0g, 1g, 2g and 3g/kg of broiler ration respectively. There was significant difference in water intake of birds among the treatment groups in all the weeks on the trial. The highest water was observed in T_1 followed by T_2, T_0 and T_3 groups in the whole experiment period. Average final live weight (kg/bird) and the daily weight gain gm/day/bird) were significantly higher in T_3 followed by T_1, T_0 and T_2 groups. The lowest FCR was found in the groups of T_2 birds whereas the average daily water intake ml/bird was significantly higher in T_1 followed by T_0, T_2 and T_3.

Keywords: Neem leaves powder, performance, water intake, FCR, water: feed, broiler chicken

Introduction
It was established that water is an important factor in poultry raising because a bird can survive several weeks without food, but only a few days without water. Broilers drink a great amount of water and a critical fact that producers may not be aware of that feed and water consumption are very closely related (Tabler, 2003) [8], for example a 2.3kg broiler will consume about 8.2kg of water, compared to approximately 4.6kg of feed (Lacy,2002) [6]. Water consumption can be affected by the number of interacting parameters: birds, water quality feed quality and poultry house environmental issues (Manning, 2007) [7]. It was estimated that the correlation between feed and water consumption was at 0.98; it means that when water consumption changes, in 98% of the cases feed consumption changes as well. Best on this fact, daily feed consumption can be established by accurate monitoring of daily water intake. Monitoring water intake on daily basis has been shown to be a reliable measure of broiler performance (Defra, 2002) [2]. Water consumption both during a day and during the entire raising period is a key indicator reflecting the state of the birds' health. Therefore, the present study has been undertaken to evaluate the performance and water intake of broiler chickens supplemented with neem leaves powder.

Materials Methods
To carry out the present investigation, 200 day old straight run, commercial broiler strain "VENCOB" chicks were procured from a commercial hatchery. These 200 chicks were divided in four groups, i.e. Group 1, 2, 3, 4, each group having 50 chicks. All the chicks from each group were divided equally to form 5 replicates of 10 chicks each in a completely randomized design (CRD).Water and starter diet for the four respective treatments were offered *ad libitum*. The four treatment groups were supplemented with neem leaf powder @ 0g, 1g, 2g and 3g/kg of broiler ration respectively.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 174-181

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 174-181
Journal homepage: http://www.ijcmas.com

Original Research Article

Study on Man-Power Utilization Pattern of Milking Operations in Dairy Animals

Archana Sachan[1*], P. S. Pramanik[1], K. D. Singh[2], A. K. Verma[2] and M. K. Verma[3]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[2]Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[3]Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
**Corresponding author*

Keywords

Man-power utilization, milking operation, hand milking, dairy animals

A B S T R A C T

The aim of the present investigation was to examine the man-power utilization pattern of milking operation in dairy animals. The present study was conducted on 23 selected milch animals at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, U.P. The loose housing system was followed in the farm and animals were maintained within the enclosure having covered area on and around the feed manger. Hand methods of milking were performed in separate milking byre in two shifts following single row system. Man-min required under hand milking operations were recorded by a stop watch and observations were taken for 30 days. The results showed that, that time required in unit operation (sec/ Litre milk) decreased with increase in milk yield of animals. Man-second utilized for unit operation of 0-2, 2-4 and 4-6 litre milk yield group was 166.94, 90.59, and 75.80 second respectively. The average total milking time required for milk yield groups of 0-2, 2-4, and 4-6 litre was 268.77±11.10, 307.09±9.23 and 390.4±10.95 second respectively. These groups had an average yield of 1.61, 3.39 and 5.15 litre milk respectively. Similarly, for evening milking, milk yield group studied were 0-2, 2-4 and 4-6 litre which has an average production of 1.52, 3.25 and 5.08 litre milk respectively. The time required for the milking of per litre of milk for these groups was 188.76, 94.21 and 65.51 second respectively. It was observed with increase in milk yield the time required in unit operation was observed to be in decreasing order. The total time required in milking operation increased from 286.92±9.73, 306.17±12.13 and 332.8±11.84 second respectively. From the present study it may be concluded that total average time spent in hand milking operation of animals was found maximum in morning milking followed by evening milking.

Introduction

The dairy farming is a two-stage production system, i.e., cultivation of fodder crops and management of milch animals, currently contributes about 132.4 million tones (Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GOI) of milk and acts as a substrate to channelize energies of 143 million men and 35 million women farm workers to participate in the production process in India (Patel and Mehla, 1988). Man-power is the most critical resources

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1238-1243

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1238-1243
Journal homepage: http://www.ijcmas.com

Original Research Article

Comparative Assessment of Fertility and Hatchability of Kadaknath and Aseel Fowls

Ajeet Kumar Verma[1]*, P.S. Pramanik[2], K.D. Singh[1], Gaurav Panday[2], H.C. Verma[3] and Rajesh Kumar Verma[4]

[1]Department of Livestock Farm Complex, [2]Department of Livestock Production Management, [3]Department of veterinary Extension Education, [4]Department of T.V.C.C., College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U.P.) 224229, India
**Corresponding author*

Keywords

Eggs, Fertility, Hatchability, Kadaknath and Aseel

A B S T R A C T

The present study was conducted to compare the fertility and hatchability of Kadaknath and Aseel fowls. For this purpose 50 birds from each breeds comprising of 45 females and 5 males were selected and kept in two different pens at poultry unit of Teaching Livestock and Poultry Farm of the College of Veterinary Science and Animal Husbandry, N.D.U.A.T. Kumarganj Faizabad (U.P.). Fertility was found higher in Kadaknath (86.18) than Aseel (81) with significant difference among them. Both hatchability on set egg and hatchability on fertile eggs were significantly differed among two breeds being higher in Kadanath. Average chick weight was found higher in Aseel than Kadaknath. Normal chick % was found highest in Kadaknath followed by Aseel. This result indicates that Kadanath are superior to Aseel in relation to fertility, hatchability and related traits.

Introduction

Indian poultry industry has made a tremendous and remarkable progress evolving from small scale backyard venture to the status of commercial, full-fledged, self sufficient and most progressive agro based industry. Poultry accounts for more than 30% of all animal protein consumption worldwide (Permin and Pedersen, 2000).Fertility and hatchability are the main factor which affects the profitability in the hatchery enterprise (Peters *et al.*, 2008).These parameters appears to be very important as for as parent stocks are kept to produce final hybrids. Hatchability is a major complex age dependent traits. Egg production and hatchability of broiler eggs can be influenced considerably by age of flock (Elibol *et al.*, 2002). Kadaknath (KN) is an important Indian reared poultry breed which is well known for poor egg production, slow growth rate, smaller body size as well as late sexual maturity. Aseel is noted for its Pugnacity, high stigma, and majestic gait and dogged fighting qualities.

The present experiment was designed –

1. To find the fertility, hatchability and associated traits in Kadaknath and Aseel.
2. To find out the correlation among hatchability traits in Kadaknath and Aseel.

Study the Haematological parameters and Oxidative stress before and after disbudding in Calves
DOI: https://doi.org/10.36811/jvsr.2021.110018 JVSR: November-2021: Page No: 62-69

Journal of Veterinary Science and Research
Research Article Open Access

Study the Haematological parameters and Oxidative stress before and after disbudding in Calves

Shiv Swaroop[1*], Pramanik PS[1], Singh KD[2], Subodh Kumar[2] and Verma AK[2]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya- 224229, Uttar Pradesh, India
[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya - 224229, Uttar Pradesh, India

***Corresponding Author:** Shiv Swaroop, Department of Livestock Production Management, India, Tel: 9936709777; 08004067773; Email: drshivswaroop59@gmail.com

Received Date: *Nov 01, 2021 /* ***Accepted Date:*** *Nov 15, 2021/* ***Published Date:*** *Nov 17, 2021*

Abstract

The aim of the present investigation was to examine the haematological profile and oxidative stress before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, ANDUAT, Kumarganj, Ayodhya and nearby villages. Twenty four cattle calves were utilized to study haematological parameters that are Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%), N/L ratio) and oxidative stress before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tremadol (T_T) and lignocaine+tremadol (T_{L-T}). After medication calves were disbudded by hot iron method. The blood samples were collected for haematological parameters & for estimation of LPO (lipid peroxides) as per method described by [1] just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. At 0h, 6h and 24h LPO was significantly different among groups. At 0h, T_0 group showed significantly highest (106.59±0.63) which was significantly different from T_L, T_T and T_{L-T} groups. It may be concluded that no significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However, Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance. At 0h, 6h and 24h LPO was significantly different among groups. At 0h, T_0 group showed significantly highest (106.59±0.63) which was significantly different from T_L, T_T and T_{L-T} groups.

RESEARCH ARTICLE

Influence of Fortifying Graded Levels of *Moringa oleifera* Leaf Powder on Growth Performance and Haemato-biochemical Indices of Broiler Chickens

Ajeet K. Verma[1]*, Partha S. Pramanik[1], Manoj K. Verma[2], Sachin Gautam[3], Rajesh Kumar[4], Saurabh[4]

Abstract

The study was conducted to evaluate the influence of *Moringa oleifera* leaf powder (MOLP) on the growth and haemato-biochemical indices of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were; basal diet with no supplement (NC- negative control) and a basal diet supplemented with antibiotics (PC-positive control), 1% MOLP (MOLP1), 1.5% MOLP (MOLP1.5), and 2% MOLP (MOLP2). Bodyweight gain (BWG), feed intake (FI), feed conversion ratio (FCR), haemato-biochemical parameters, and economics were assessed in 35 days of the experiment. The results showed that BWG of birds was significantly ($p < 0.05$) higher in all Moringa supplement groups than NC group, but similar to PC group birds. Feed intake and FCR of Moringa supplemented and PC groups were significantly ($p < 0.05$) lower than the NC group, except MOLP2, which showed no difference in FI compared with the NC group. MOLP1.5 group birds recorded the best value of FCR among different groups. The highest profit per broiler was recorded in MOLP1.5 followed by MOLP1 and MOLP2 than NC, similar to the PC group. Hb and PCV values of the MOLP1.5 group were significantly ($p < 0.05$) higher than the NC group but comparable to the PC group. Platelet and WBC count were significantly ($p < 0.05$) lower in Moringa supplemented groups than NC and PC groups. A significant ($p < 0.05$) reduction was observed in blood glucose, SGPT, SGOT, cholesterol, and triglyceride levels of Moringa supplemented groups as compared to broilers of PC and NC groups. From the results, it was concluded that supplementation of 1.5% *Moringa oleifera* leaf powder improved the performance of birds without any detrimental effect on their health.

Keywords: Broilers, Growth performance, Haemato-biochemical profile, Leaf powder supplement, *Moringa oleifera*.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.3.7

Introduction

A very strong demand for animal protein for human beings has expanded, consolidated, and globalized in countries of all income levels. The poultry industry in India is one of the fastest-growing livestock sectors, with a growth rate of 8.51 and 7.52 % in egg and broiler production, respectively (BAHS, 2019). Antibiotic feed additives in food-producing animals have been used to meet the increasing demand for animal protein, including improved feed utilization, promotion in growth, and prevention from pathological micro-organisms. However, usage of antibiotic feed additives as growth promoters leads to harmful effects on consumer's health due to augmentation of microbial resistance and residual effect. Considering microbial resistance builds-up forces to reduce antibiotic feed additives in livestock and poultry production (Cheng *et al.*, 2019). Investigating safe and natural antibiotics alternatives is a tremendous challenge for animal scientists and veterinarians to meet the increased demand for providing wholesome meat at a low cost. Dietary inclusion of herbal plants and their extracts have been used as an alternative to antibiotic growth-promoter in poultry production (Movahhedkhah *et al.*, 2019).

[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[3]Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

Corresponding Author: Ajeet Kumar Verma, Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India, e-mail: ajeetverma95@gmail.com

How to cite this article: Verma, A.K., Pramanik, P.S., Verma, M.K., Gautam, S., Kumar, R., & Saurabh. (2021). Influence of Fortifying Graded Levels of *Moringa oleifera* Leaf Powder on Growth Performance and Haemato-biochemical Indices of Broiler Chickens. Ind J Vet Sci and Biotech, 17(3): 31-35.

Source of support: Nil

Conflict of interest: None.

Submitted: 21/01/2021 **Accepted:** 21/05/2021 **Published:** 16/08/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

SHORT COMMUNICATION

Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India

Manoj K. Verma[1]*, Vindhyavashini K. Singh[1], Jaswant Singh[1], Ajeet K. Verma[2]

Abstract

The present study was aimed to evaluate morphometric characteristics of lambs of less known native sheep of Gang-Fatehpuri of Fatehpur district of Uttar Pradesh during different growth stages in its breeding tract for breed recognition and registration with NBAGR, Karnal, India. A total of 365 lambs of either sex of different age groups (94, 102, 95, and 74 heads of 3, 6, 9, and 12 months of age, respectively) were surveyed in 15 villages of Fatehpur district. The overall values of body weight and body measurements, *viz.*, body length, height at withers, chest girth, tail length, and ear length recorded at 12 months of age (sexual maturity) were 29.62 ± 0.46 kg, 73.47 ± 0.46 cm, 73.54 ± 0.51 cm, 77.63 ± 0.43 cm, 40.08 ± 0.23 cm, and 18.29 ± 0.13 cm, respectively. The mean values of all the traits, except ear length, of male lambs, were significantly ($p < 0.05$) higher/larger than female lambs. The differences gradually increased significantly ($p < 0.01$) with advancing age from 3 months to 12 months. The values were generally comparable with the earlier known sheep breeds like Muzaffarnagari, and Kajali of the region.

Keywords: Body measurements, Body-weight, Gang-Fatehpuri, Mutton type breed.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.4.17

Introduction

India has vast biodiversity of ovine genetic resources with multipurpose utility for wool, mutton, milk, skin, and manure. The livestock population develops through unique adaption to their agro-climatic environments and their survival over a prolonged duration. Sheep rearing is a valuable component of the rural economy of India's arid, semi-arid and hilly areas. A systematic attempt to characterize and conserve animal breeds were started after establishing the National Bureau of Animal Genetic Resources (NBAGR) at Karnal, India. In addition to 44 well-recognized sheep breeds, many unrecognized, uncharacterized, and lesser-known sheep genetic populations are disseminated in the entire country. The biometric measurements of different body parts have a significant relationship with the body-weight of animals (Nayak *et al.*, 2008; Mishra *et al.*, 2016; Dass *et al.*, 2019).

The body measurements (body length, height at withers, chest girth) and body weight are used as an indicator of adult size, feeding requirements, and physiological maturity of animals. Furthermore, based on body measurements, an association can be established between body conformation and functionality of animals. Thus, body measurements can assist in the evaluation of growth performance as well as the meat production potential of Gang-Fatehpuri sheep. In view of the facts above, the present study aimed to evaluate the body weights and body morphometric measurements during the growth period of one year of this breed, as part of its recognition and registration with the Animal Genetics Bureau.

© The Author(s). 2021 Open Access This work is licensed under a Creative Com...

[1]Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India

[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India.

Corresponding Author: Manoj K. Verma, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India, e-mail: manojvet550@gmail.com

How to cite this article: Verma, M.K., Singh, V.K., Singh, J., Verma, A.K. (2021). Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India. Ind J Vet Sci and Biotech, 17(4), 80-82.

Source of support: Nil

Conflict of interest: None.

Submitted: 12/02/2021 **Accepted:** 11/07/2021 **Published:** 10/10/2021

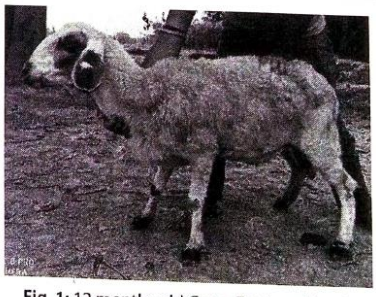


Fig. 1: 12 months old Gang-Fatehpuri lamb

VOL. XII, ISSUE XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

EFFECT OF *MORINGA OLEIFERA* LEAF EXTRACTS ON CARCASS CHARACTERISTICS AND MORTALITY OF BROILER CHICKENS

A. K. Verma[1], P. S. Pramanik[1], M. K. Verma[2], Jaswant Singh[2], Ruma Devi[3], A.K. Srivastav[2]andGaurav Panday[1]
[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya,
[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[3]Department of Livestock Product Technology, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
ajeetverma95@gmail.com

(MS Received: 25.07.2021; MS Revised: .29.08.2021; MS Accepted: 29.09.2021)

MS 2738 **(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT)**

Abstract

The present study was carried out to evaluate the influence of Moringa oleifera leaf extracts on carcass traits and mortality of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were; basal diet with no supplement (NC- negative control) and basal diet supplemented with antibiotics (PC-positive control), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE). Percent weight of various cut parts, eviscerated weight and drawn yield were evaluated after 35 days of experiment. The results showed significantly higher eviscerated weight and drawn yield percentage in Moringa extracts supplemented groups compared to PC group. PC and MOAQE group recorded significantly (P<0.05) higher drumstick % compared to NC, MOEE and MOALE group. Moringa extracts group recorded significantly (P<0.05) lower mortality than PCand NC group birds. From above results it was concluded that supplementation of Moringa extract of 1.5% Moringa oleifera leaf powder improved the carcass traits and reduced the mortality of birds.

Key words: *Broiler, Extract, Carcass, Mortality and Moringa (words in alphabetical order)*

Introduction

Major cost involved for poultry enterprise is in the form of feed. Various approaches such as feed supplements and additives are being used to obtain more net return and to minimize expenditure on feed (Agasheet *al*., 2017). *Moringa oleifera* leaf (MOL) has fascinated great attention as a non-traditional feed component because of its unique qualities. Moringa oleiferagrows fast, drought-tolerant tree native belonging to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. Moringa is currently cultivatedglobally in the tropics and subtropics (Faheyet *al*., 2001). Crude protein content in Moringa varies from 25% to more than 30% on a dry matter basis (Melesse et al., 2013), with a high proportion of essential amino acids (Lu *et al*., 2016). Moringa leaves, flowers and Pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron and alpha-tocopherol (Dahot M.U., 1988). Moringa leaves are the preferred part of tree for use in animal diets as leaf meal due to high nutritional and medicinal properties (Abbas, 2013). The meat obtained from broiler chickens is an excellent source of protein, vitamins, mineralsand lower in fat content, so having a great demand among non-vegetarians(Naji *et al*., 2013).Addition of*Moringa oleifera* leaf meal in broilers diet resulted significant increase in dressed weight, eviscerated weight and dressing percentage (Ayo-Ajasa *et al.* 2016). Dietary supplementation of Moringa leaves would be a potential strategy to improve the meat quality in broilers due to its antioxidant potential. It was further reported that phytosterols could lower malondialdehyde content and increase glutathione concentration in the breast muscle of broiler chickens (Naji *et al*., 2013).

This study was carried out to evaluate the effect of different extracts (1.5%) of *Moringa oleifera* leaves powder as feed supplement in broiler diets on carcass characteristicsand mortality of broiler birds.

(Please correct red marks)

Materials and Methods

The present experiment was conducted after an approval from "Institutional animal ethical committee (IAEC)" was obtained vide reference number IAEC/CVSc/P-36/2019. A total of 250 one-day old Vencobb-430 strain chicks were randomly allocated into five dietary treatment groups with 5 replicates of 10 chicks in each. The chicks were kept on five dietary treatments which includes a basal diet without any additive in negative control (NC) or that supplemented with antibiotics (Positive control-PC), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE) in basal diet. Birds were fed *ad libitum* in different phases of experimental trial. The composition of formulated experimental diets as per BIS (2007) has been given in Table 1.

The chicks were kept on deep litter system under uniform standard management conditions with availability of clean, fresh and wholesome drinking water. Mortality was recorded during the entire research period. At the end of trial one bird per replicate (5 birds/treatment) were selected randomly for the carcass evaluation and sacrificed after 12 hours pre-slaughter fast though drinking of water was allowed. After complete bleeding carcass were dipped in hot water (58°C) for 1-2 minutes and feather were removed. Evisceration was done by making a slit from tip of breast bone up to the area around the cloaca. Thorough washing and cleaning were done after evisceration. After that the carcass were kept hanging on the special racks for 5-10 minutes. The visceral organs were removed by supporting the bird with one hand via the incised abdomen. Eviscerated carcasses were weighed and cut parts like thigh, drumstick, breast, wings, back, head, neck and shank were also weighed.The relative weight of dressed, drawn yield and different edible cuts were calculated as percentage of live weight.

The data were analysed under completely randomized (CRD) by employing one way analysis of variance (Snedecor and Cocran, 1994) and means of different dietary treatments were compared with Duncan multiple range test. The P value lower than 0.05 was thought-out significant.

(Please correct red marks)

Results and Discussion

Carcass characteristics:

The data pertaining to the carcass traits of broilers presented in Table 2. The results showed that the dressed weight and thigh weight of different groups was similar and showed no significant (P>0.05) effect of various Moringa extracts. The eviscerated weightof aqueous extract (72.24), ether extract (73.10) and alcoholic extract (73.09) supplemented group broilers were similar to NC (72.05) group, however significantly (P<0.05) higher than PC (70.39). The drawn yield of MOAQE, MOEE, MOALE and NC also significantly (P<0.05) higher than PC group. Leg and drumstick weight % of PC group was significantly (P<0.05) higher than MOEE and MOALE group. However, leg weight was

Int.J.Curr.Microbiol.App.Sci (2017) *6*(2): 1610-1619

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 2 (2017) pp. 1610-1619
Journal homepage: http://www.ijcmas.com

Original Research Article

http://dx.doi.org/10.20546/ijcmas.2017.602.211

Study of Phasic Development and Growth Attributes of Rice Cultivars at Variable Weather Condition

Rajan Chaudhari, Ashish Singh*, S.R. Mishra, A.K. Singh and A.N. Mishra

Department of Agricultural Meteorology, Narendra Deva University of Agriculture and Technology Narendra Nagar, Kumarganj, Faizabad-224229 (U.P), India
**Corresponding author*

Keywords

Phenophases,
LGR,
CGR,
RGR.

Article Info

Accepted:
24 January 2017
Available Online:
10 February 2017

ABSTRACT

A field experiment was conducted during *kharif season* of 2014-15 at N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) in sandy loan soil. The experiment consisted of 9 treatment combinations comprised of three transplanting dates *viz*., July 5 (D_1), July 15 (D_2) and July 25 (D_3) and three varieties viz., Sarjoo-52 (V_1), NDR-359 (V_2) and Swarna (V_3). It was observed that different phenophases of rice markedly varied with not only dates of transplanting but also different weather variables which ultimately creates the different crop growing environment to harvest the yield accordingly. Among the three varieties, it was also observed that different phenophases has taken higher days in V_1 as compare to V_2 and in different days of transplanting higher linear growth rate (LGR) was recorded in D_2than D_1 and D_3.Crop growth rate (CGR) in V_3 recorded highest CGR as compare to V_1 & V_2. V_3 maintained the superiorly of RGR and possess highest growth rate 0.40 mg/g/day over V_2 (0.36 mg/g/day) and V_1 (0.29 mg/g/day).

Introduction

Rice yields have been increasing since the 1960s, but since the 1990s, growth in rice production has been slower than population growth Indeed, it is anticipated that rice production will need to increase by 30% by 2025 in order to sustain those who need it for sustenance. However, climate change, especially access to water, soil erosion and other problems threaten rice yields. The impact of air temperature on rice growth would be specific because of the different sensitivity of different locations with regard to temperature. In tropical regions, the temperature increase due to the climate change is probably near or above the optimum temperature range for the physiological activities of rice (Baker *et al*., 1992). Such warming will thus reduce rice growth. In addition, higher temperatures will cause spikelet sterility owing to heat injury during panicle emergence. In temperate regions, increased air temperatures should hasten rice development, thereby shortening the time from transplanting (or direct seeding) to harvesting and reducing the total time for photosynthesis yield development (Neue and Sass, 1994). Rice is very sensitive to higher temperature during reproductive stage especially flowering and anthesis. It is necessary to identify genetic donors for heat stress from high temperature rice growing environments. Temperature stress affects at

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 1256-1259 (2017)

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

LIVESTOCK PRODUCTION AND MANAGEMENT IN RELATION TO CLIMATIC VARIABILITY IN EASTERN INDIA

Anil Kumar Singh
Department of Agricultural Meteorology, N.D.University of Agriculture & Technology, Kumarganj, Faizabad-224 229
aksmausam@gmail.com,

ABSTRACT

A bench mark survey pertaining to Livestock production and management in relation to climate variability was done during 2005-2007 in Eastern India. In the present study the temperature, humidity, air movement, solar radiation and rainfall are major climatic parameters affected the nutritional plan of animals through the amount of crops and pastures. The milk yield of all mammalian species undergoes seasonal variations. In cattle, the yield was relatively unaffected within the temperature range of 5 to 21°C. At temperature lower than 5°C as well as from 21-27°C, the yield decreased slowly whereas above 27°C the decline was much faster. Milk production decreased approximately by 1 kg for each degree rise in rectal temp. In Eastern U.P. the livestock population in high rainfall and low lying area (Gorakhpur & Siddharthnagar) and low rainfall and undulated area of Mirzapur division is very interesting that in Gorakhpur during 1988-2003, percentage increase of Buffalo was 37% followed by Goat 21%.While in Mirzapur, the population of all livestocks increased unexpectedly. Pig increase was 166% followed by Buffalo and Sheep 78% and 77% respectively. Goat percent was also increased by 56% i.e. rural masses more depend on livestock may be due to poor socio-economic status, undulated topography, erratic rainfall and drought prone region of the eastern U.P. Within the range of environmental temp. 9°C to 29°C egg production in the domestic fowl was not reduced. Thermal stress especially sharp changes in temp. adversely affected both egg weight and shell quality. 24 hrs. exposure to 380 resulted in sudden temporary drop in egg production of some strains. RH and Photoperiod hampered the Sheep rearing in Jharkhand as increased humidity retards wool growth. Lactating animals present in Eastern U.P., Bihar and Jharkhand, in 2004-05 declined by around 40.90%, 35.16% and 25.35% respectively as compared to that in 1981-82. Scanty availability of round the year fodder production due to undulant rainfall patterns has made the specific changes in the animal rearing in these three states.Almost all farmers fed green fodders (Berseem, Bajra, Maize and Jowar) as well as chaffed Dry fodder (Wheat straw, Paddy straw & kadbi of Bajra, Maize & Jowar) to their animals. Concentrate mixture was provided to animal mostly at time of milking (98.2%, 98.6% and 97.6%) respectively in these three states. In Bihar the concentrate feeding to the animals is found to be maximum whereas in Jharkhand grazing pastures available are maximum probably due to high rainfall pattern during last 15 years. The scarcity fodder availability was also maximum in Jharkhand state.The majority of the farmers of eastern U.P. prefers stall feeding to their animals as compared to the farmers of Bihar & Jharkhand states. In all three states the animal diseases like FMD, BQ, H.S., Pneumonia, Diarrhoea, Bloat, Mastitis and Protozoal diseases like Theileriosis, Surra and other Parasitic diseases were more frequent in last one decade. Weather Based Disease Forecast (WBDF) is to be provided at regional levels to sustain various diseases to increase reproductive efficiency in livestock species. As per the livestock census of 2003 the population of sheep in Jharakhand state has declined by about 31% as compared to that of in 1981-82. Therefore, rectified methods to be evolved for maintaining and breeding of sheep production as a lucrative business as per the present climate change in Eastern India. Also the alternative sources of fodder crops such as subabool, peepal leaves and ber leaves for sustainable meat production for marginal farmers is to be suggested.

Climate change is frequently considered a major conservation threat to the country. The Earth's climate has already warmed by 0.5°C over the past century and recent studies show that it is possible to detect the effects of a changing climate on ecological systems. Changes in climate in recent decades are apparent all over the globe at all levels of ecological organization: population and life-history changes in species composition of communities and structure and functioning of ecosystems. Although it is impossible to prove that climate change is the cause of ecological effects. It is no longer safe to assume that all of species historic range remains suitable. Importance of climate change as a current threat to species emphasize the need for current conservation efforts to consider climate change in both insitu conservation and reintroduction efforts. These studies can contribute to preparations for future challenges by providing valuable input to models. The temperature, humidity, air movement, solar radiation and rainfall are major climatic parameters affecting the nutritional plan of animals through the amount of crops and pastures.

RESULTS AND DISCUSSION

In Eastern U.P. the livestock population in high rainfall area (Gorakhpur) and undulated low rainfall area of Mirzapur division is very interesting that in high rainfall area of Gorakhpur percentage increase of Buffalo is 37%

Vegetos- An International Journal of Plant Research

Ajit Singh Vegetos (Special) 2017
Doi: 10.5958/2229-4473.2017.00034.5

Research Article

A SOCIETY FOR PLANT RESEARCH PUBLICATION

Yield Gap Analysis and total Rainfall of Rice crop of Onset of Monsoon in Different Sectors of U.P

Ajit Singh*, A.K. Singh, Smita Gupta and U.P. Shahi

Abstract

The onset date of south west monsoon in eastern U.P./ central U.P. shifted to 19th/20th June from normal date 15th June. Total rainfall in relation to onset of monsoon decreased by 6% if monsoon reaches on 19th June in eastern U.P. as compare to rainfall of normal date (15th June) and 9.5 %if monsoon reaches on 25th June. Consequent upon length of rainy season was also decreased from normal 108 days to 99 days in eastern U.P. whereas reduction in length of rainy season in other sectors of U.P. ranged between 12-13 days. Rainy day and rainfall intensity both reduced in all sectors of U.P. In eastern U.P. rainfall intensity reduced from 25 mm/day (1971-1990) to 17.2 mm/day (1992-2011), i.e. 32 % reduction hence crop planning may be made accordingly in respective sectors. Yield gap of crop has been calculated at particular amount of rainfall over the year of data with difference of maximum yield and minimum yield at same amount of rainfall. Variability of seasonal rainfall in different sectors of U.P. was also in same order and magnitude as that of total rainfall.

Keywords
Yield gap, onset of monsoon.

Introduction

Rice is the country's most important crop economically and culturally. The total area under rice is estimated to be about 11 million ha occupying 55% of the total cropped land. The climate of Ping River Basin is dominantly affected by Monsoon. The Monsoon (rainy season), winter and summer. Rainy season or Southwest Monsoon Season (May to Mid-October) is dominated by the southwest monsoon, during which time rainfall in the north is at its heaviest. India climatology exhibits a strong trend and inter-decadal variability. The variability in recent decades (Post-1980) seems to be strongly ENSO and it is the main cause of many of the disastrous Inter annual climate fluctuations affecting tropical and sub-tropical countries . Assessment of the adverse effects of climate variability on agriculture might help to properly anticipate and adapt farming to optimize agricultural production (James, 2008). In this article, three major issues related to climate variability, impacts of climate variability on rain -fed rice production and adaptation strategies in the face of varying climate are addressed. The weather and its variability are well known to the farming community and have great impact on crop production. The economy of the farmers is well influenced by weather. The greatest risk to crop yields in Indian agriculture is attributed to the variability of seasonal rainfall and the uncertainty in the amount and its distribution in a given season. Hence, rainfall is one of the prime meteorological factors which control the water balance of a particular area. Therefore, its amount, time of occurrence and spatial variability controls the agricultural practices adopted in the region (Baweja 2011).

The rainfall process exhibits a high degree of variability of space and time and its relation determine the environment and development of particular region. It is not only crucial agroclimatic parameter to the agricultural activities but also one of the design for ground water recharge (Ramos, 2001). The challenges of global agriculture have been analysed exhaustively and the need has been established for sustainable improvement in agricultural production aimed at food security in a context of increasing pressure on natural resources (Cassman 2012, Connor and Minguez 2012). Of a total global land area of 13,000 Mha, arable land and permanent crops account for by 12%, permanent meadows and pastures for 26%, forests for 30% whereas 32% of this land is unsuitable for agriculture (FAO 2011). Analysis that accounts for suitability of remaining land for cropping and alternative land uses concludes that expansion of cropping land to 2050 is likely to be small. Globally, 15% of arable land is irrigated and currently accounts for 42% of all crop production; 7100 km3 of water are consumed annually to produce food globally whereas feeding the world population of around 9 billion by 2050 would require an additional 2100 km3 year (Sumberg 2012, Rockstrom *et al*. 2012).

Materials and Methods

The rainfall data of 20 years (1992-2011) of Uttar Pradesh received from Department of Agriculture statistics, Directorate of Agriculture Uttar Pradesh, Lucknow has been analyzed to evolve the rainfall based planning the farm operations, crop management and cropping system with minimum risk to utilize the rainfall efficiently for increased production.

Uttar Pradesh is the most populous state in India with a population of over 199.5 million people, geographical area of 2,40,928 square km as of 1 March 2011. It is situated at 27°40'N Latitude & 80° 00' E Longitude. The latitude & longitude of districts of U.P. Study districts has been show in Fig 1

Onset of SW monsoon

The guidelines to be followed for declaring the onset of monsoon over Kerala/over country are enlisted is below:

Rainfall

If after 10th May, 60% of the available stations in the state the rainfall of 2.5 mm or more for two consecutive day, the onset over Kerala be declared on the 2nd day, provided the following criteria are also in concurrence;

i) ***Wind field***

Depth of westerlies should be of magnitude maintained upto 600 hPa, in the box equator to lat. 10°N and Long. 55°E to

Corresponding author: Ajit Singh, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology, Faizabad
Email: kuranpurwar036@gmail.com

Received: February 11, 2017 **Revised:** April 29, 2017 **Published:** June 30, 2017.

All articles published in Vegetos- International Journal of Plant Research are the property of SPR, and is protected by copyright laws. Copyright © 2017, SPR. All Rights Reserved.

Int. J. Agricult. Stat. Sci. Vol. 13, No. 1, pp. 333-335, 2017 *ISSN : 0973-1903*

ORIGINAL ARTICLE

STUDIES ON CROP WEATHER RELATIONSHIP OF MUSTARD (*BRASSICA JUNCEA* L.) CROP IN ALLAHABAD REGION

Ashish Singh*, B. Mehera[1], A. K. Singh[2], S. R. Mishra[2], A. N. Mishra[2], Neelam Khare[1] and Ajit Singh[2]

[1]Department of Environmental Science, School of Forestry & Environment, Sam Higginbottom Institute of Agriculture, Technology and Sciences, (Formerly- Allahabad Agricultural Institute) Deemed-to-be-University, Allahabad - 211 007, India

[2]Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad - 224 229, India.

E-mail : asmausam@gmail.com

Abstract : The present investigations were on five varieties and tried in randomized block design with four replications. Five varieties namely Yellow gold, Parasmani, SCM-565, Varuna and SRM-777 were used in experiment. The soil of experimental plot was loamy sand in texture, low in organic carbon and available nitrogen, phosphorus and available potassium. The result of the present investigation indicated that the maximum germination, flowering and maturity was recorded in varieties SRM-777 and minimum in Yellow gold. The maximum number of pod development was noted in varieties SRM-777 and minimum in Parasmani. The weather parameter was recorded in average range to all varieties.

Key words : Tmax, Tmin, Mean temperature, Temperature range, Morning and evening RH, BSS, Physiological stages.

1. Introduction

Brassica is a winter season crop and its physiological as well as morphological developments are markedly influenced by temperature conditions during different physiological stages. Indian mustard [*Brassica juncea* (L.)] is a crop of tropical as well as temperate zones requiring somewhat cool and dry weather for satisfactory growth and development. High temperature at flowering stage causes reduction in seed yield as it may lead to pollen sterility [Malarkadi (2007)]. Although mustard is a long day plant requiring 16 h of light period in 24 h cycle, it can be made to flowering, if it is provided with a cycle of 8 h of light period with 4 h of dark period (short night). Mustard can be made to flower in about 50 days under 16/8 h light/dark period. Due to its hardy nature and capacity to thrive well under poor conditions of fertility and moisture, it is generally raised as rainfed crop due to which its average yield is low. Mustard is the crop of tropical as well as temperate zone. The temperature requirement varies from 0.5-3.0°C (min.) to 35-40°C (max.) with an optimum of temperature regime of 20-35°C. Cool temperature, dry weather with good amount of bright sunshine increases the oil yield. Mustard needs high temperature for vegetative growth (*i.e.* 20-32 °C) and cool temperature with clear sky during reproductive growth and maturity. Significant response of oilseed to the tune of 30-40% was recorded due to the use of secondary major nutrients and micronutrients and with significant residual effect in cropping system. In tropical environment of central plane zone Indian conditions [Srivastava (2003), Nanda (1996)], mustard sowing usually start from mid-October but in some parts of this region, sowing is delayed due to the late harvest of transplanted rice. The average yield of mustard is only 999 kg/ha in India, which is very low compared to other mustard growing countries of the world [Anonymous (2002-2003)].

2. Materials and Methods

The five cultivars of mustard *viz.*, Yellow gold, Parasmani, SCM-565, Varuna and SRM-777 were sown at 25th October during the year 2013- 14 with recommended package of practices Agrometeorological weather station farm, School of forestry and environment, SHIATS Allahabad. The size of the each plot was 2m × 2m with a row-to-row spacing of 30 cm and plant-to plant spacing of 10 cm. Thinning was done manually at 25 days after sowing to maintain plant population of 30/m². The soil of the experimental

**Author for correspondence* *Received November 22, 2016* *Revised April 10, 2017* *Accepted April 28, 2017*

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(3): 841-844
Received: 10-03-2017
Accepted: 11-04-2017

Ashish Singh
Department of Agricultural Meteorology, N D University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, N D University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology, N D University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Ashish Singh
Department of Agricultural Meteorology, N D University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Impact assessment of climate change on rice yield using simulation model

Ashish Singh, AK Singh and AN Mishra

Abstract
Rice crop yield prediction using normalized yield difference analysis on seasonal basis reveal that maximum temperature may cause the reduction in yield of rice in Eastern U.P. by 1% to 1.2% / ha during 2020 to 2080. Minimum temperature may decrease the yield of rice by 1.5% to 1.8% / ha. South-West monsoon rainfall will remain the major factor for controlling the yield of rice by the end of 2080. Increase of yield in Eastern U.P. may increase to the extent of 28% to 30% / ha. Future prediction of Tmax & Tmin scenario on monthly basis predicts that the month of December and January will be hotter than November contrary to normal trends. For T minimum the prediction in Eastern U.P., increase of temperature will be during month of December and January for 2020 to 2080. The rate of increase of Tmax those during months in Eastern U.P. will be higher during 2050-2080 (2 to 4 °C) as compared to 2020 to 2050(1 to 2 °C). During 2020, the rainfall will be lower in Eastern U.P. Terminal drought (60 DAT -75 DAT) at 50% flowering to milking stage is more severe to reduce the rice yield as compared to drought at early tillering (15 to 25 DAT) and vegetative stage (45 to 60 DAT). Simulated yield of rice reduced from average 2020 to 2080 in the tune of 15.13%, 11.19%, and 14.09% under July 5th, July 15th, July 25th transplanting of rice variety Sarjoo-52 respectively. The Rate of decrease of simulated yield of rice Sarjoo-52 variety under 2020 to 2080 was faster under delayed transplanting of July 25th. Integrated crop management emphasized in future besides developing short duration, drought tolerant varieties responsive to low inputs.

Keywords: Simulation, Climate, Eastern U.P, Rice, Prediction

1. Introduction
Crop simulation models can integrate knowledge of physiological process and morphological traits to help explain yield formation in environments varying in physical, biological and agronomic factors. These simulations can be used to evaluate key interactions quickly and identify traits with the greatest impact on yield potential (Aggarwal *et al.*, 1997) [1] and for assessing the relationship between crop productivity and environmental factors.
Crop simulation models can predict responses to large variations in weather. At every point of application weather data are the most important input. The main goal of most applications of crop models is to predict commercial output like grain yield, fruits, root, biomass for fodder, etc. Crop simulation models are used in USA and in Europe by farmers, private agencies and policy makers to a great extent for decision making. Under Indian climatic condition, these applications have an excellent role to play. Rice is mainly grown as rainfed crop in Uttar Pradesh but Uttar Pradesh is highly risk prone in respect of rainfall either due to delayed monsoon, intermittent drought or terminal drought and even floods in north Eastern part of Uttar Pradesh causing great loss of rice production. Therefore, prediction of rice production not only in state as a whole but also at district level is rather uncertain due to vagaries of monsoon. Hence, modeling approach can be adopted for prediction in the state at macro or micro level. Simulation models which help in predicting the yield of a crop is therefore is the need of the day. It is essential to have pre-harvest estimate of production for Uttar Pradesh due to its importance on state as well as national economy. Hence present investigation was undertaken.

Materials and Methods
Collection of daily historical weather data of last (20 years), crop data & soil data were made. Minimum data set for Rice crop for last three years was required for operation and evaluation of simulation model. Calibration of simulation model was made with the historical data of kharif rice 2013 and 2014. Validation of the model was done with the experimental data of kharif rice 2015 and 2016. For impact assessment of climate change on Rice yield of Future prediction of Rice crop under Agro-climatic conditions of Eastern U.P., Prediction of

Int.J.Curr.Microbiol.App.Sci (2017) 6(8): xx-xx

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 8 (2017) pp. xx-xx
Journal homepage: http://www.ijcmas.com

IJCMAS

Original Research Article

http://dx.doi.org/10.20546/ijcmas

Yield Forecast of Rice Crop in Eastern U.P. using Simulation Model

Ashish Singh, A. K. Singh, A. N. Mishra and C. B. Singh*

Department of Agricultural Meteorology, N D University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad-224229 (U.P), India

**Corresponding author*

Keywords

Yield, Prediction, Model, calibration, Validation, DSSAT

Article Info

Accepted:
xx June 2017
Available Online:
xx August 2017

ABSTRACT

An experiment was conducted during kharif 2015 and 2016 at Agro met Research Farm of NDUAT as to basis the yield forecast Yield Forecast of rice crop in Eastern U.P. using simulation Model. The genetic coefficients were determined by the Decision Support System for Agro Technology Transfer (DSSAT) model using the identical management and other conditions as in the field experiment for three varieties of rice (Sarooj-52, NDR-359 and Swarna). These determined coefficients were used in the subsequent in calibration on validation and other applications. Results reveal that observed value of grain yield of rice in July 5th transplanted rice was higher over simulated value. Due to higher number of days taken to anthesis and physiological maturity over simulated value. Due to delay in transplanting, the grain yield of rice decreased in accordance with observed value too. This shows the better sensitivity of DSSAT model.

Introduction

An Agricultural model contains many simple, empirically derived relation-ships that do not completely represent actual plant processes. When models are adequately tested against observed data (calibration and validation process), the results represent agricultural output under current climate conditions. The agricultural models simulate the current range of agricultural technologies available worldwide.

They do not include potential improvements in such technology, but can be used to test the effects of some potential improvements, such as improved varieties and irrigation schedules. A range of agricultural models are used widely by scientists, technical extension services, commercial farmers and resource managers to evaluate agricultural alternatives in a given location under different conditions. Decision Support System for Agro Technology Transfer (DSSAT) includes a basic set of tools for the preparation of the input data, as well as application programmes for seasonal, crop rotation and spatial analysis. (Anonymous, 2007 and Aggarwal *et al.*, 1997) In simulation of systems, carbon from canopy assimilation forms the essential core of most simulations that deal with the growth of vegetation. Change in weather to warm and humid may lead to the more rapid development of a plant disease, a loss in yield

Journal of Medicinal Plants Studies 2017; 5(3): 338-342

Journal of Medicinal Plants Studies

ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating 2017: 3.53
JMPS 2017; 5(3): 338-342
© 2017 JMPS
Received: 20-03-2017
Accepted: 22-01-2017

Krishna Deo
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

SR Mishra
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

AK Singh
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

AN Mishra
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Ashish Singh
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Correspondence
Krishna Deo
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Water requirement of wheat crop for optimum production using CROPWAT model

Krishna Deo, SR Mishra, AK Singh, AN Mishra and Ashish Singh

Abstract
A field experiments was conducted during *rabi* seasons of 2014-2015 and 2015-2016 at the Agro met Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) The treatment comprised of four levels of irrigation schedule *Viz*.. I_1 (critical stages), I_2 (0.6 IW: CPE ratio), I_3 (0.8 IW: CPE ratio), and I_4 (1:0 IW: CPE ratio). The findings of present investigation indicated that the growth and yield attributes of wheat were significantly influence due to different irrigation schedule. The results, further revealed that growth attributes such as plant height (cm) and Leaf area index (LAI) were found significantly higher under I_1 (critical stages) treatment. The highest grain yield (52.3 and 52.2 q/ha) and straw yield (65.8 and 66.9 q/ha) recorded under I_1 (critical stages) treatment. The lowest grain yield (51.2 and 51.9 q/ha) and straw yield (64.4 and 65.3 q/ha) was recorded under I_2 (0.6 IW: CPE ratio).Water requirement of wheat crop simulated by CROPWAT model was 237.8 and 266.9 mm for the whole crop season during 2014-15 and 2015-16 respectively. In initial stage minimum water requirement was simulated by model. The highest crop water requirement (130.7& 136.7 mm / decade) recorded in the late stage of growth which was 45.0 and 48.7% of total water requirement of wheat crop during the years 2014-15 and 2015-16. The phase wise reduction in Etc, yield and cumulative yield reduction was less in I_1 (critical stages) as compared to other treatments.

Keywords: cropwat model, yield reduction, leaf area index, grain yield, straw yield, water requirement.

Introduction
CROPWAT is a computer program for irrigation planning and management, developed by the Land and Water Development Division of FAO (FAO, 1992) [3]. Its basic functions include the calculation of reference evapotranspiration, crop water requirements, and crop scheme irrigation. Through a daily water balance, the user can simulate various water supply conditions and estimate yield reductions and irrigation and rainfall efficiencies. Typical applications of the water balance include the development of irrigation schedules for various crops and various irrigation methods, the evaluation of irrigation practices, as well as rainfed production and drought effects. There are two new versions of the CROPWAT: one is CROPWAT v 7.0 that contains a completely version in Pascal, developed with the assistance of the Agricultural College of Velp, Netherlands. It overcomes many of the shortcomings of the original 5.7 version. CROPWAT 7.0 is a DOS-application, but it runs without any problem in all MS-WINDOWS environments. Another one is CROPWAT for Windows that is written in Visual Basic and operates in the Windows environment. It has been developed with the assistance of the International Irrigation & Development Institute (IIDS) of the University of Southampton, UK. Both versions use the same FAO (1992) [3] Penman-Montieth method for calculating the reference crop evapotranspiration. These estimates are used in crop water requirements and irrigation scheduling calculations. Some of the interpolation methods used in CROPWAT for Windows are slightly different (up to 2%) to those used in CROPWAT 7.0.

Materials and Methods
Model input data
The CROPWAT model version 8.0 was calibrated for wheat crop for different irrigation regimes. Daily weather data (minimum temperature, maximum temperature, relative humidity, sunshine hours) have been given as input for computation of ETO. Similarly rainfall was also given as input for calculation of effective rainfall. The crop characteristic such as planting date, phase wise Kc values, stage duration, rooting depth were given. In soil file soil characteristics Total available soil moisture (mm/meter), rain infiltration rate (mm/day),

Journal of Medicinal Plants Studies 2017; 5(3): 343-347

Journal of Medicinal Plants Studies

ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating 2017: 3.53
JMPS 2017; 5(3): 343-347
© 2017 JMPS
Received: 23-03-2017
Accepted: 20-04-2017

Krishna Deo
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

SR Mishra
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

AK Singh
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

AN Mishra
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Ashish Singh
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Sanjay Kumar
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Correspondence
Krishna Deo
Department of Agricultural Meteorology N. D. University of Agriculture & Technology Kumarganj, Faizabad, U.P., India

Determination of suitable irrigation schedule for optimum water use efficiency of wheat crop.

Krishna Deo, SR Mishra, AK Singh, AN Mishra, Ashish Singh and Sanjay Kumar

Abstract
A field experiments was conducted during *rabi* seasons of 2014-2015 and 2015-2016 at the Agromet Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) The treatment comprised of four levels of irrigation schedule *Viz*., I_1 (critical stages), I_2 (0.6 IW: CPE ratio), I_3 (0.8 IW: CPE ratio), and I_4 (1.0 IW: CPE ratio). The findings of present investigation indicated that the grain and straw yields as well as most of the growth and yield attributes of wheat were significantly influence due to different irrigation schedule. The results, further revealed that growth attributes such as plant height (cm), number of shoots m^{-2} and Leaf area index (LAI) were found significantly higher under I_1 (critical stages) treatment during both year 2014-15 and 2015-16. The total number of effective tillers m^{-2}, length of spike (cm), harvest index (%) and test weight (gm) were found higher under I_1 (critical stages) and I_4 (1.0 IW: CPE ratio) treatment during both years. The highest grain yield (52.3 and 52.2 q/ha) and straw yield (65.8 and 66.9 q/ha) recorded under I_1 (critical stages) treatment during the both years of 2014-15 and 2015-16. The lowest grain yield (51.2 and 51.9 q/ha) and straw yield (64.4 and 65.3 q/ha) was recorded under I_2 (0.6 IW: CPE ratio) during both years. The highest WUE (16.42 and 16.70 kg ha^{-1} mm^{-1}) was recorded under I2 (0.6 IW: CPE ratio) treatment and lowest (14.69 and 14.96 kg ha^{-1} mm^{-1}) under I_1 treatment.

Keywords: irrigation schedule, leaf area index, water use efficiency, grain yield, straw yield, harvest index.

Introduction
Wheat *(Triticum aestivum* L.*)* is one of the most important cereal crop in large number of countries in the world. It provides about 20% of total food calories for the human race. It is widely grown through the temperate zone and in some tropical and sub-tropical areas at higher elevation. The major wheat growing countries in the world are USSR, USA, China, India, Canada, Australia, France, Turkey and Pakistan. It ranks first (Anonymous, 2013) [2] in the world among the cereals both in respect of area (225.43 mha) and production (708.0 mt). Water is essential at every developmental phase starting from seed germination to plant maturation for harvesting the maximum potential yield of wheat. There is a positive correlation between grain yield and irrigation frequencies (Bajwa *et al.*, 1987) [3]. Availability of adequate amount of moisture at critical stages of plant growth not only optimizes the metabolic process in plant cell but also increases the effectiveness of the mineral nutrients applied to the crop (Bajwa *et al.*, 1993) [4]. Water deficit imposed after planting significantly reduces the plant growth and yield (Harold, 1986).Normal irrigations are essential for bumper crop production, but when there is scarcity of water, it becomes imperative to differentiate the critical growth stages of the crop where irrigation could be missed, without reducing the grain yield significantly (Timsina *et al.*, 1998) [16]. Irrigation missing at some critical growth stage sometime drastically reduces grain yield (Chauhan *et al.*, 2008) [7] due to lower test weight (Bajwa*et al.*, 1993) [4]. However, number of productive tillers per unit area remains unaffected (Rana, 1976) [12]. Similarly, over irrigation also sometimes tends to decrease grain yield instead of increasing yield (Kahlown and Azam, 2002) [8]. Among the various factors responsible for poor productivity of wheat, the irrigation scheduling is one of the major is play a vital role among them

Materials and Methods
Experimental site
The experimental site is located at the main campus of university on the left side of Faizabad

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special Issue [2] 2017: 169-171
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE **OPEN ACCESS**

Effect of sequential application of herbicides on weed flora and grain yield in direct seeded rice (*Oryza sativa* L.)

Ram Pratap Singh, Manoj Kumar, R.S. Singh, Raj Kumar, A.K. Singh and A.N. Mishra
N.D. University of Agriculture &Technology, Kumarganj, Faizabad-224 229 (UP)
Email: rampratapsingh666@gmail.com

ABSTRACT

An experiment was conducted during the two consecutive seasons of Kharif 2015 and Kharif 2016 in the silty loam soil at Agronomy Research Farm of N.D.U.A.T., Kumarganj, Faizabad, (UP). The experiment was conducted in Randomized Block Design which comprised of ten treatment combinations viz T_1 - Pendimethalin (PRE) fb Bispyribac - Na (POE) (1000 fb 25g ha^{-1}), T_2 - Oxadiargyl (PRE) fb Bispyribac - Na (POE) (100 fb 25 ha^{-1}), T_3 - Pendimethalin (PRE) fb Fenoxaprop (POE) (1000 fb 67 ha^{-1}), T_4 - Oxadiargyl (PRE) fb Fenoxaprop (POE) (100 fb 60 ha^{-1}), T_5 - Pendimethalin (PRE) fb 2, 4-D Na (POE) (1000 fb 60 ha^{-1}), T_6 - Butachlor (PRE) fb Bispyribac Na (POE) (1500 fb 25 ha^{-1}), T_7 - Butachlor (PRE) fb 2, 4 -D Na (POE) (1500 fb 60 ha^{-1}), T_8 - Butachlor (PRE) fb Fenoxaprop (POE) (1500 fb 67 ha^{-1}), T_9 - Weed free (25 and 45 DAS) and T_{10} - Weedy check (PRE and POE application at 3 DAS and 25 DAS). Rice variety 'NDR-359' was seeded in rows spacing 20 cm apart using seed drill. Results reveals that at 60 DAS, among the weed management practices, Pendimethalin (PRE) 1.0 kg ha^{-1} fb bispyribac-Na (POE) 0.025 kg ha^{-1} (4.25) was recorded significantly lower weed density which was at par with T_2 and T_6 while significant as compare to rest of the herbicide treatment. Significantly superior weed management under weed free plots were recorded as comparison to overall treatments with weedy check. Higher weed control efficiency was recorded under treatment with Pendimethalin (PRE) 1.0 kg ha^{-1} fb bispyribac-Na (POE) 0.025 kg ha^{-1} (62.46 %) followed by T_2 (61.22 %) and T_6 (59.89 %) as compare to rest of the herbicidal treatment while its highest value were recorded in weed free treatment. The significantly maximum grain yield was found in Pendimethalin (PRE) 1.0 kg ha^{-1} fb bispyribac - Na (POE) 0.025 kg ha^{-1} (3.83 q ha^{-1}) which was at par with T_2, T_5 and T_6 as compared to rest herbicidal treatment while treatment T_7 and T_3 recorded significantly higher value over T_4, T_8 and weedy check. Significantly highest grain yield was found in weed free plots. Consequently, the highest benefit : cost ratio were recorded under Pendimethalin (PRE) 1.0 kg ha^{-1} fb bispyribac - Na (POE) 0.025 kg ha^{-1} (Rs. 1.77 per Re. invested) followed by T_2 and T_6. Lowest benefit cost ratio were found in weed free and weedy check.
Keywords: *DSR, Pre emergence, Post emergence, Herbicides, B:C ratio, WCE.*

Received 21.07.2017 Revised 05.08.2017 Accepted 24.08.2017

INTRODUCTION

Rice is the staple food crop of India. It is grown in an area of 43.95 million ha with total production of 104.32 million tonnes and with an average productivity of 2.40 t ha^{-1}. Uttar Pradesh ranks 2nd in total rice production. Weed infestation is the major constraints in direct seeded rice causing severe yield losses. Success adoption of direct seeded rice (DSR) depends largely on weed control especially with chemical methods as mechanical weed control is labour intensive and not cost effective. Various herbicides have been used for controlling weeds in DSR but efficiency of chemical methods based on single herbicide treatment may be non significant because of their narrow spectrum of weed control. Application of several herbicides in sequence can be more useful (Chauhan and Yadav 2013). Hence keeping above facts in view the present investigation was under taken.

METHODOLOGY

An experiment was conducted during the two seasons of *Kharif* 2015 and *Kharif* 2016 at Agronomy Research Farm of N.D.U.A.T., Kumarganj, Faizabad, (UP). The experiment was conducted in Randomized Block Design and replicated three times. The experiment comprised of ten treatment combinations viz T_1 - Pendimethalin (PRE) *fb* Bispyribac - Na (POE) (1000 *fb* 25g ha^{-1}), T_2 - Oxadiargyl (PRE) *fb* Bispyribac - Na (POE) (100 *fb* 25 ha^{-1}), T_3 - Pendimethalin (PRE) *fb* Fenoxaprop (POE) (1000 *fb* 67 ha^{-1}), T_4 -

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special Issue [2] 2017: 142-145
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE **OPEN ACCESS**

Effect of integrated nutrient management on growth and yield of wheat under late sown condition

Ram Pratap Singh, Vipin Patel, A.K. Singh, A.N. Mishra, Raj Kumar and R.S. Singh
N.D. University of Agriculture &Technology, Kumarganj, Faizabad-224 229 (UP)
Email: rampratapsingh666@gmail.com

ABSTRACT

The field experiment was conducted during winter season of 2015-16 at Agronomy Research Farm of N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad. The experiment consisted of treatment viz, T_1 (Control), T_2 (Inorganic source of nitrogen), T_3 (100% RDF + 25% N through FYM), T_4 (100% RDF + 25% N through Vermicompost), T_7 (75% RDF through inorganic sources (120N: 60P : 40K), T_8 (75% RDF through inorganic sources +25% N through FYM), T_9 (75% RDF through inorganic sources + 25%N through Vermicompost), T_{10} (75% RDF through inorganic sources + 25% N through FYM + Azotobactor) and T_{11} (75% RDF through inorganic sources 25% N through Vermicompost + Azotobactor) were conducted in Randomized Block Design with three replications. Results revealed that growth parameters such as plant height, number of shoots m^{-2}, total dry matter accumulation m^{-2} were significantly higher in 100% recommended dose of fertilizers and 25% N through Vermicompost + Azotobactor over other treatments. Yield attributes viz., spike length and number of grains spike $^{-1}$ were increased significantly with 100% recommended dose of fertilizers through inorganic source and 25% N through Vermicompost + Azotobactor which was at par with all treatments excepted T_1, T_7,T_8 . Grain and straw yields and nutrient (NPK) uptake were maximum with 100% recommended dose of fertilizers and 25% N through Vermicompost + Azotobactor. Application of 100% of recommended dose of nitrogen through inorganic source + 25 % N Vermicompost + Azotobactor - improved available N P and K content in soil as compared to other treatments. Protein content was maximum with T_6 (100% recommended dose of fertilizers and 25% N through Vermicompost + Azotobactor). Highest gross returns were obtained with 100% recommended dose of fertilizers + 25% N through Vermicompost followed by T_5.The highest B: C ratio (1.78) were calculated with T_6 followed by T_5 (1.73) and lowest T_1 (1.10).

Keywords: *RDF, B:C ratio, Azotobactor, FYM and Vermicompost.*

Received 11.07.2017 Revised 02.08.2017 Accepted 20.08.2017

INTRODUCTION

Wheat (*Triticum aestivum* L.) belongs to the family Poaceae is a staple food of the world. The important and economic consideration for increasing wheat productivity is the effective use of nitrogen fertilization. Nitrogen fertilization is the most important factor in front of wheat agronomist for achieving high yield targets. Previous research reviewed that number of tillers, spikes m^{-2}, plant height, spike length, number of spikelet's, grains spike^{-1}, grain yield and straw yield of wheat increased with increased nitrogen level (Sobhoel *et al.*, 2000). Sufficient supply of nitrogen at optimum planting time also resulted good quality and vigorous seed. The use of organic manure as a renewable source of plant nutrients is assuming importance. In this endeavor proper blend of organic and inorganic fertilizer is important not only for increasing yield but also for sustaining soil health (Weber *et al.* 2007 and Pullicinoa *et. al.* 2009).

The vermicomposting is bio oxidation and stabilization of organic material involving joint action of earthworm and micro organisms. Although, microbes are responsible for the biological degradation of the organic matter, earthworms are the important drivers of the process, conditioning the substrate and altering biological activity (Aira *et. al.* 2002). Farmyard manure by adding organic matter improves the physical condition of soil by increasing water holding capacity for maximum utilization of water. Application of FYM and inorganic N in integration improved the productivity and monetary returns of wheat and also maintained soil fertility (Sharma *et al.* 2007). Application of farmyard manure (FYM) to soil have been practiced for many centuries and its application to soil have increased crop yield, improved soil fertility, increased soil organic matter, increased microbiological activities and improved

Int.J.Curr.Microbiol.App.Sci (2017) *6*(6): 1423-1431

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 6 (2017) pp. 1423-1431
Journal homepage: http://www.ijcmas.com

EXCELLENT PUBLISHERS

Original Research Article

https://doi.org/10.20546/ijcmas.2017.606.167

Recurrence Frequency and Variability Analysis of Fog Events for Planning and Management of Potato in Eastern U.P. India

Nitish Kumar[1*], A.K. Singh[1], S.R. Mishra[1], Praveen Kumar Singh[2], Chandan Kumar Singh[3] and Vikash kumar Singh[4]

[1]Department of Agricultural Meteorology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad -224229(U.P.), India
[2]Department of Vegetable Science, [3]Department of Plant Pathology, NDUAT Kumarganj, Faizabad-224229 (U.P.), India
[4]Department of Plant Pathology, SHUATS, NAINI Allahabad (U. P.), India
**Corresponding author*

Keywords

Annual variation of fog, Monthly variation of fog, Fortnightly variation of fog.

Article Info

Accepted:
19 May 2017
Available Online:
10 June 2017

ABSTRACT

The recurrence frequency of fog events on annual, decadal, seasonal and fortnightly basis of eastern Uttar Pradesh, Faizabad district were made from long period average data of 1986-2015. From 2012 onwards in December and January months the fog frequency increased exponentially. In terms of percentage of fog frequency during second fortnight (1986-2014), 37% frequency of occurrence of fog above the normal was recorded in November, 48 % in December and 44% in January and in month of February it was 68%.Total 33% fog occurrence was recorded in first decade (1986-1995) 38 % in 2nd decade (1996-2005) i.e. 5% increase as compared to first decade then after decreased to 29% in 3rd decade (2006-2015) hence indicated that fog occurrence was osolllating between 29% to 38%. December and January months were recorded higher days of fog occurrence in each decade. In the decade 1986-95, out of total, 32% fog days occurred in December, and 30% in January. While in 2nd decade (1996-2005) it was 29.5 and 42% in December and January respectively and in 3rd decade it was further increased in December to 36 % but decreased from 42% to 38 % in January. In Monthly variation December and January months were recorded higher days of fog occurrence in each decade.

Introduction

Possible impact of climate change on frequency and severity of weather extremes can have a significant impact on agriculture production, but their effect is often unclear, this may be due to interaction with other factors that affect yield and due to lack of precise definitions of relevant weather extremes (Vanoort, 2012). The Climate variability and weather extremes are principal sources of fluctuations of annual productivity of many crops in arid and semi-arid environments. Of the total annual crop losses in world agriculture, many are due to direct weather and climatic effects such as drought, flash floods, untimely rains, frost, hail, and storm. Temperature and precipitation are the major weather variables that determine the variability of crop yields (Bannayan and Sanjani, 2011). Under the impact of future scenario of climate change and global

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(1): 610-613
Received: 24-11-2017
Accepted: 26-12-2017

Ajit Kumar
Department of Agronomy, NDUAT Kumarganj, Faizabad, U.P. India

Anil Kumar Singh
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Sanjay Kumar
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Dinesh Kumar
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Tarun Gopal
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Deepak Pandey
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Vinay Kumar Pandey
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Correspondence
Ajit Kumar
Department of Agronomy, NDUAT Kumarganj, Faizabad, UP, India

Effect of nutrient management and moisture regime on growth and yield of wheat (*Triticum aestivum* L.)

Ajit Kumar, Anil Kumar Singh, Sanjay Kumar, Dinesh Kumar, Tarun Gopal, Deepak Pandey and Vinay Kumar Pandey

Abstract
The field experiment was conducted at Agronomy Research Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *Rabi* season of 2014-15 and 2015-16. Comprised whitsixteen treatments combination formed Viz; four moisture regime, and four nutrient management which were allocated in split plot design with three replications. The four moisture regime I_1; 0.6 IW/CPE ratio I_2; 0.8 IW/CPE ratio I_3; 1.0 IW/CPE ratio and I_4; 1.2 IW/CPE ratio were as main plot and four nutrient management 100% RDF through inorganic fertilizers (120:60:40 kg NPK ha^{-1}). 75% NPK+ 25% N through FYM (90:45:30 kg NPK ha^{-1}). 50% NPK+ 50% N through FYM (60:30:20 kg NPK ha^{-1}) (d) 25% NPK+75% N through FYM (30:15:10 kg NPK ha^{-1}) were kept as sub plots. The growth attributes *viz*; number of shoots, plant height, dry matter accumulation and yield attributing characters *viz*, number of grains $spike^{-1}$, number of spike m^2, length of spike, test weight, grain and straw yield, harvest index, nutrients uptake by crop was significantly increased 75% RDF (90:45:30 kg NPK/ha +25% N through FYM along withI_4; 1.2 IW/CPE ratio moisture regimewhich was at par with 100% RDF(120:60:40 kg NPK/ha)along with I4; 1.2 IW/CPE ratio moisture regimeand significantly higher over rest of the treatment as well as economics of various treatments were recorded. Moisture regime of 1.0 IW/CPE ratio (5-6irrigations) was found suitable for achieving higher yield of wheat with 75% RDF (90:45:30 kg NPK/ha +25% N through FYM followed by 100% RDF (120:60:40 kg NPK/ha) was found suitable higher growth and yield of wheat crop. On the basis of results obtained, application of 75% RDF (90:45:30 kg NPK/ha +25% N through FYM, nutrient supply system and I4; 1.2 IW/CPE ratio moisture regimefound to be more suitable for higher yield of wheat variety Malviya 234.

Keywords: Wheat; Moisture regime; Nutrient; Varieties; Growth; Economics; Yield

Introduction
Wheat (Triticumaestivum L.) is a staple food of the world and falls under Poaceae family. It is primarily grown in temperate regions and also at higher altitude under tropical climatic areas in winter season. It is the single most important cereal crop that has been considered as integral component of the food security system of the several nationsWheat is the single, most important cereal crop that has been considered as integral component of the food security system of the several nations. It ranks first in the world among the cereals both in area with 225.43 mha and production with 708.0 mt. In India, total area under wheat is 29.90 mha with the production and productivity of 93.90 mt and 3.14 t ha-1 respectively (Anonymous, 2014).
The normal time for sowing of dwarf wheat in irrigated tracts starts in the beginning of November. Medium to long duration varieties taking 135-145 days to mature should be sown in the first fortnight of November while, short duration varieties (120-125 days) may be sown in the second fortnight of November.The productivity of wheat in eastern U.P. is very low (25 q ha-1) and it might be due to adoption of cereal-cereal (Rice-Wheat) cropping system, poor management in balanced fertilization, etc. Increasing level of production can be achieved by increasing level of fertilizer, but continuous use of chemical fertilizers alone may lead diminishable yield even with the recommended dose of fertilizer application. Besides chemical fertilizer alone may also lead to same detrimental effect on physical and chemical properties of soil and may not be so remunerable unless the fertility of soil is maintained at sustainable level by application of organic manures. Therefore to maintain fertility and productivity of soil at sustainable level for long duration, there is a need to adopt the concept of integrated nutrient management. Organic manures such as farmyard manure are to be considered and integral component and may help to recover soil health in cropping system (Ranwa and Singh, 1999) as they improve soil fertility and physical properties. Organic matters in soil improve physical

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 2274-2277

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 2274-2277
Received: 09-07-2018
Accepted: 10-08-2018

Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Anil Nishad
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad,

Effect of energy requirement on growth and yield at Rabi maize (*Zea mays* L.) on various moisture regimes

Purusharth Katiyar, AK Singh, SR Mishra, Rajan Chaudhari, RK Aryan, Nitish Kumar and Anil Nishad

Abstract
A field experiment was carried out at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season of 2016-17 to study the "Effect of energy requirement on growth and yield at Rabi maize (*Zea mays* L.) on various moisture regimes." The experiment comprised of nine treatment combinations and conducted in Split plot design and replicated four time. Experiment consisted of three crop growing environment viz. 60x 20 cm spacing, 60 x 25 cm and 60 x 30 cm spacing were kept in main plots with three moisture regimes Viz. 0.6 IW/CPE ratio, 0.9 IW/CPE ratio and 1.2 IW/CPE ratio were kept in sub plot. Result reveal that Crop growing Environment of 60x20 cm spacing (83,333 plants/ha) was found suitable for optimum growth and yield of Rabi maize. Among crop growing environment, sowing done at 60x20 cm spacing recorded higher days taken from sowing to maturity while among moisture regime 1.2 IW/CPE ratio recorded higher days taken from sowing to maturity. Moisture regimes of 1.2 IW/CPE ratio was found suitable for higher growth and yield of Rabi maize. Crop growing Environment of 60x20 cm spacing and Moisture regimes of 1.2 IW/CPE ratio recorded higher heat use efficiency from sowing to maturity of Rabi maize.

Keywords: Maize, dry matter GDD, HUE, yield

Introduction
Maize (*Zea mays* L.) is an ideal crop owing to its quick growing habit, high yielding ability, palatability and nutritious ness. It can be grown in any season and is one of the most important cereal crop of the world human and feed for animals. Maize is very efficient utilizer of solar energy and has immense potential for higher yield. Each climatic zone has its own characteristics and as such different hybrids, composites and local varieties maturing in 60 to 150 days are being grown (Jain *et al.*, 1981) [3]. It can be fed to cattle at any stage, as there is no problem of poisoning to cattle with HCN or oxalic acid in plant unlike sorghum and therefore it is called as Queen of cereals and King of fodder. The father of green Revolution Renowned Nobel Laureate Dr. Norman E. Borlaug, has mentioned maize as the crop of future. In future maize can play vital role in ensuring food security as well as nutritional security by use of quality protein maize for the country as well as world as a whole. In Maharashtra, maize is principally a rainy season crop but the climatic variability and eco-physiological limitations are the major constraints to achieve potential yield of maize in traditional rainfed *kharif* season in the state. Recent studies conclusively proved that maize is a potential winter season crop having three times higher yield potential than *kharif* crop (Desai and Deore, 1980; Nayak *et al.*, 1987) [2, 5]. Water and nutrient is the key factor to increase the productivity of this crop. In India, maize is grown in diverse environments-from the dry area of Chitradurga, Karnataka to the warm wet plateau of Chindwara, (M.P). Since maize is largely grown under rainfed conditions during the rainy season, the crop is sown with the onset of the monsoon. Sowing window of maize occurs during Ist fortnight of June to the Ist fortnight of July depending upon the onset of the monsoon. Maize yields during the winter season are higher than during the rainy season. During winter, maize enjoys a favorable environment of cool temperatures, clear sky and higher solar radiation interception with less nutrient losses; less infection of insect pests and thereby better yields (Joshi *et al.*, 2005) [4]. Winter maize crop which makes the best use of low temperature and sunshine hours has longer growth duration of about 150-170days than 100-120 days under *Kharif* crop. As such in winter it synthesizes more food material resulting in higher yields. Yield obtained in *Rabi* season is invariably higher (>6t/ha) than the *Kharif* season yield (2-2.5t/ha). In the world, maize occupies an area of 185.12 million

Int.J.Curr.Microbiol.App.Sci (2019) *8*(4): 2002-2009

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 04 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.804.234

Study of Phenophasic Climatic Requirement for Maximum Yield of Rice in the Prevailing Weather Conditions

Sandeep Kumar Sharma, S.R. Mishra, A.K. Singh, A.N. Mishra, Sarvesh Baranwal* and S.K. Shukla

Department of Agricultural Meteorology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad-224 229 (U.P.), India

**Corresponding author*

Keywords

Growing degree days, Photothermal units, Heliothermal units, Heat use efficiency

Article Info

Accepted:
15 March 2019
Available Online:
10 April 2019

A B S T R A C T

A field experiment was conducted during *kharif season* of 2017-18 on the topic entitled "Effect of growing environment on growth and development of rice (*Oryza sativa L.*) cultivars." in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). The experiment consisted of nine treatment combinations comprised of three transplanting dates *viz.* July 5th, July 15th and July 25th and three varieties viz., NDR-97, NDR-3112 and BPT-5204. Results reveal that different phenophases of rice markedly varied with only dates of transplanting but also different weather variables which ultimately create the different crop growing environment to harvest the yield accordingly. Highest Growing Degree days (GDD) was recorded in growing environment of July 5th due to occurrence of long duration. Highest heliothermal and photothermal unit was recorded in 1st date of transplanting on July 5th at vegetative stage.

Introduction

Rice (*Oryza sativa* L.) is the paramount cereal crop after wheat belonging to the grass family, poaceae, extensively cultivated in most parts of the world and is the major staple food for more than half of the global population (FAO, 2013). Rice is a staple food of more than 50 per cent of the world's population (Anonymous, 2011) During 2013-14 in India, rice is cultivated in an area of 46 million ha with a production of 106.5 million tonnes and yield 2424 kg ha1(Agricultural statistics at a glance, 2014). However, productivity of rice in India is much lower than that of other rice producing countries. The impact of air temperature on rice growth would be location-specific because of the different sensitivity of different locations with regard to temperature. In tropical regions, the temperature increase due to the climate change is probably near or above the optimum temperature range for the physiological activities of rice [Baker *et al.*, 1992]. Such warming will thus reduce rice growth. Rice productivity is highly dependent upon

Journal of Agrometeorology 20 (Special issue -"NASA 2014" part-II) : 198-201 (February 2018)
Short Communication

Study of perception of climate awareness constraints and impact of weather forecast in Bahraich district (U.P.)

GULAB SINGH[1*], A.K. SINGH[2], PADMAKAR TRIPATHI[2], AJIT SINGH[2], JEETANDRA PANDEY[2] and NITISH KUMAR[2]

[1]Research Scholar, Department of Agricultural Meteorology & Physics, BCKV, West Bengal-741252, India,
[2]Department of Agricultural Meteorology, N.D.U.A. &T. Kumarganj Faizabad, U.P.-224229
**Email: gulab1990127@rediffmail.com*

Agriculture is one of the most important sectors and plays a vital role in the development of the Indian Economy. A large part of the Indian agriculture depends on monsoon rains and agriculture production and essential commodity market shows fluctuation due to early/delayed arrival of monsoon. Any change in rainfall pattern impacts agriculture and hence the country's economy and food security. Climate change is one of the most important global environmental challenges with implications for food production. For India, the IPCC predicts 10-40 percent loss in crop production by the year 2080-2100. Increased heat stress associated with global climate change may, however, cause distress to dairy animals and possibly impact milk production. Dairy sector may lose 1.8 million tons of milk by 2020 due to climate stresses in different parts of the country.

Selection of village Banpurwa was done under jurisdiction of K.V.K, Bahraich (U.P) and then selected 60 farmers from the village comprised of 20 marginal farmers 20 small farmers and rest 20 rich farmers. Benchmark survey was made with respect to village profile, Individual farmer profile, Perception/ knowledge of farmers about climate change and its impact on agriculture/farmers assessment of weather parameters, Exposure and vulnerability of agricultural crops to climate change., Adverse effect on agriculture crop stages, Adaptation strategies/measure taken up by farmers; i. Crop adaptation strategies. ii. Soil and water conservation measures. iii. Adaptation strategy by means of crop insurance. iv. Farmers expectations to mitigate the ill effects of climate change and Individual farmer's perception on Agro met advisory services.

The farming household and the number of farmers are presented in table 1. It is evident from the survey that total Farming households in the village was 1602 in which marginal were 614; small 788 and rest 200 farmers were under rich category. Total population was recorded 6414, out of which male population were 3605 and female population were 2809. SC population in the village was recorded 1062 in which male population were 610 and female population were 452. ST population was totally nil in the village. Total irrigated area in the village was recorded 3492 ha. The number of households engaged in crop production was recorded 1223.

Farmers of 3 group's i.e. Marginal, Small and Rich farmers were categorized on the basis of Family size, Age group and Education as shown in table 2. It is quite evident from the data presented in table 2 that highest percentage of farmers of each group belonged to family size between 5-8 members, while above 8 family members were found in lowest percentage. An examination over data revealed that in both Small farmers and rich farmers the highest percent were of >60 years age old farmers. Highest 80% of marginal farmers were illiterate while lowest % of farmers (20%) were up to 10th passed. Highest % of Small and rich farmers were graduate in the selected village of study. Similar results have been reported by Nagaratna, *et al*. 2012.

Perception of farmers on changes in the precipitation is presented in table 3. Perusal of data presented in table 3 reveal that the No. of rainy day was more than normal during before the year 2000 while beyond 2000 its value showed less than normal while amount of rainy days during recent past was found medium. As per survey report of farming, onset of rainfall was found irregular during all the years. Rainfall was changed during crop growing period (July-Oct.) as per opinion given by selected farmers but change in the rainfall pattern have less variation during recent past as compared to high variation before the year 2000. Crop growing period reduced during the year 2000 and also in very recent past i.e. since last 5 years. Similar results have

Int.J.Curr.Microbiol.App.Sci (2018) 7(2): 59-66

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 03 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.703.007

Effect of Moisture Regime and Nutrient Management System on Yield and Economics of Wheat (*Triticum aestivum* L.)

Ajit Kumar, Sanjay Kumar*, Anil Kumar Singh, Dinesh Kumar, Harikesh, Tarun Gopal, Deepak Pandey and Vinay Kumar Pandey

Department of Agronomy, NDUAT Kumarganj, Faizabad-224 229, UP, India

**Corresponding author*

Keywords

Wheat, Moisture regime, Nutrient, Varieties, Growth, Economics, Yield

Article Info

Accepted:
04 February 2018
Available Online:
10 March 2018

A B S T R A C T

The field experiment was conducted at Agronomy Research Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *Rabi* season of 2014-15 and 2015-16. Sixteen treatments comprised of four levels of moisture regime (a) I1; 0.6 IW/CPE ratio (b) I2; 0.8 IW/CPE ratio (c) I3; 1.0 IW/CPE ratio and (c) I4; 1.2 IW/CPE ratio and four levels of fertilizers ((a) 100% RDF through inorganic fertilizers (120:60:40 kg NPK ha-1) (b) 75% NPK+ 25% N through FYM (90:45:30 kg NPK ha-1) (c) 50% NPK+ 50% N through FYM (60:30:20 kg NPK ha-1) (d) 25% NPK+75% N through FYM (30:15:10 kg NPK ha-1) were tested in a split plot design with three replications. The growth attributes *viz.*, number of shoots, plant height, dry matter accumulation and yield attributing characters *viz.*, number of grains spike^{-1}, number of spike m^{2}, length of spike, test weight, grain and straw yield, harvest index, nutrients uptake by crop was significantly increased 75% RDF (90:45:30 kg NPK/ha +25% N through FYM along with I4; 1.2 IW/CPE ratio moisture regime which was at par with 100% RDF(120:60:40 kg NPK/ha)along with I4; 1.2 IW/CPE ratio moisture regime and significantly higher over rest of the treatment as well as economics of various treatments were recorded. Moisture regime of 1.0 IW/CPE ratio (5-6irrigations) was found suitable for achieving higher yield of wheat with 75% RDF (90:45:30 kg NPK/ha +25% N through FYM followed by 100% RDF (120:60:40 kg NPK/ha) was found suitable higher growth and yield of wheat crop. On the basis of results obtained, application of 75% RDF (90:45:30 kg NPK/ha +25% N through FYM, nutrient supply system and I4; 1.2 IW/CPE ratio moisture regime found to be more suitable for higher yield of wheat variety Malviya 234.Wheat cultivar Malviya 234accrued the maximum net return with B:C ratio of 2.76 under 1.0 IW/CPE moisture regime (I3) with 100% RDF through inorganic fertilizers (120:60:40 kg NPK ha-1).

Introduction

Wheat (*Triticum aestivum* L.) is a staple food of the world and falls under Poaceae family. It is primarily grown in temperate regions and also at higher altitude under tropical climatic areas in winter season. It is the single most important cereal crop that has been considered as integral component of the food security system of the several nations Wheat is the single, most important cereal crop that has been considered as integral component of the

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1092-1096

Ajit Singh
Department of Soil Science, Saradar Vallabhbhai Patel University of Agriculture & Technology Meerut, U.P. India

AK Singh
Department of Agriculture Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, U.P., India

UP Sahai
Department of Soil Science, Saradar Vallabhbhai Patel University of Agriculture & Technology Meerut, U.P. India a

SP Singh
Department of Soil Science, Saradar Vallabhbhai Patel University of Agriculture & Technology Meerut, U.P. India

Smarpal Singh
Rani Lakshmi Bai Central Agricultural University, Jhansi, U.P. India

Correspondence
Ajit Singh
Department of Soil Science, Saradar Vallabhbhai Patel University of Agriculture & Technology Meerut, U.P. India

The analysis of climatic variability/weather trends (past and future) in eastern U.P.

Ajit Singh, AK Singh, UP Sahai, SP Singh and Smarpal Singh

Abstract
Underneath these trends is that of decadal scale variability in the Pacific basin at least induced by the Interdecadal Pacific Oscillation (IPO), which causes decadal changes in climate averages. On interannnual timescales El Ni˜no/Southern Oscillation (ENSO) causes much variability throughout many tropical and subtropical regions and some mid-latitude areas. During the course of the 21st century global-average surface temperatures are very likely to increase by 2 to 4.5 ^{o}C as greenhouse gas concentrations in the atmosphere increase. By concentrating on changes in climate means, the full impacts of climate change on biological and human systems are probably being seriously underestimated. Here, we briefly review the possible impacts of changes in climate variability and the frequency of extreme events on biological and food systems, with a focus on the developing world. We present new analysis that tentatively links increases in climate variability with increasing food insecurity in the future. Climatic variability & weather trend analysis were made for past and future based on the historical data results reveal that. Future rainfall scenario of eastern U.P. Showed much varying trends in monthly rainfall and was observed that in eastern U.P. rainfall will increase during south west monsoon period up to 2080 but the month of August will face sharp decline in rainfall. Projected trends in temperature and rainfall over eastern U.P. reveal that rainfall will not significantly affect the yield of rice crop as compared to temperature. The rate of increase of maximum temperature in eastern U.P. will be higher during 2050 to 2080 (2-4 ^{o}C) as compared to 2020-2050 (1-2 ^{o}C).

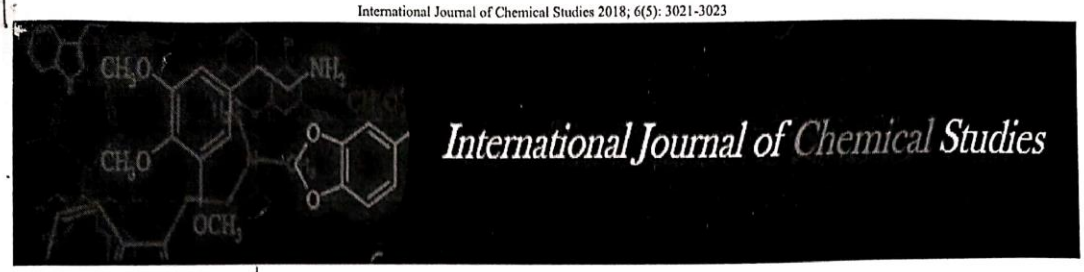
Keywords: Climatic Variability, Weather Trends, Past and Future, Eastern U.P

Introduction
Climate change has many elements, affecting biological and human systems in different ways. The considerable spatial heterogeneity of climate change impacts has been widely studied; global average temperature increases mask considerable differences in temperature rise between land and sea and between high latitudes and low; precipitation increases are very likely in high latitudes, while decreases are likely in most of the tropics and subtropical land regions (IPCC, 2007).

It is widely projected that as the planet warms, climate and weather variability will increase. Changes in the frequency and severity of extreme climate events and in the variability of weather patterns will have significant consequences for human and natural systems. Increasing frequencies of heat stress, drought and flooding events are projected for the rest of this century, and these are expected to have many adverse effects over and above the impacts due to changes in mean variables alone (IPCC, 2012). The cooler period of climate in the 19th century and rapid global warming during the late 20th century. Over the last millennium climate has varied by as much as 1 ^{o}C globally. Key questions of any future impacts of global warming are the effects on human society and economics, and in particular, on agriculture and forestry. History can provide very valuable lessons on effects of climatic variability on the human dimensions. The multidecadal cooling of the late 16th century in Europe resulted in one of the peak cooling excursions of the so called Little Ice Age epoch of Europe. This example of climate variability provides impacts of a mere 0.5 ^{o}C cooling in annual mean temperature on society. Increases were observed in surface global temperatures during the 20th century, and interannual climate variability has been observed in many regions of the globe. The 1982/83 and 1997/98 El Ni˜nos and the 1991 Mt. Pinatubo volcanic eruption. Caused considerable variability in the interannual climate of tropical regions in the late 20th century.

Climate variability and trends have significant environmental and socioeconomic impacts. Global challenges such as food security, biodiversity loss, water scarcity and human health are affected by reference evapotranspiration, temperature, solar radiation, and precipitation together, but nonlinear dynamics of these four climatic factors have not been assessed simultaneously at the national scale.

International Journal of Chemical Studies 2018; 6(5): 3021-3023



P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(5): 3021-3023
© 2018 IJCS
Received: 05-07-2018
Accepted: 10-08-2018

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Jeetendra Pandey
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Performance of growth and yield on under variable moisture regimes at wheat (*Triticum aestivum* L.) cultivars

RK Aryan, AK Singh, SR Mishra, Rajan Chaudhari, Purusharth Katiyar, Nitish Kumar and Jeetendra Pandey

Abstract
A field experiment was carried out at Agrometeorology Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season 2017 to study the "Performance of growth and yield on under variable moisture regimes at wheat (*Triticum aestivum* L.) cultivars." The experiment consisted of 9 treatment combinations and tested in Randomized block design with three replications. Experiment consisted of three moisture regimes viz. 0.8 IW/CPE ratio, 1.0 IW/CPE ratio and 1.2 IW/CPE ratio and three wheat cultivars Viz. HUW-234, PBW-343 and NW-1012. Wheat cultivar PBW-343 was found suitable for optimum growth and yield of wheat. Highest Consumptive use (67.7 cm) was found in moisture regime of 1.2 IW/CPE ratio and highest water use efficiency (81kg ha^{-1} cm^{-1}) was computed under 0.8 IW/CPE ratio. Among wheat cultivars highest water use efficiency of 74 kg ha^{-1} cm^{-1} was computed in PBW-343 cultivar of wheat.

Keywords: wheat, water use efficiency, light interception yield

Introduction
Irrigated wheat is grown in rotation with rice on 2.6 Mha in the intensive rice–wheat system in north India (GOP, 2006) [6]. However, the sustainability of the rice–wheat system is threatened by declining soil fertility and ground water depletion (Humphreys *et al.*, 2010; Ladha *et al.*, 2007) [7, 8]. Nearly 60% of arable land worldwide is dedicated to cereal production. Fertilizers are constrain factor limiting crop productions such as wheat (Chamara *et al.*, 2003, Derksen *et al.*, 2002, Mohammaddoust *et al.*, 2006) [2, 4, 9]. The demand for wheat by 2020 has been projected to be between 105-109 million tonnes. Most of this increase in production will have to manage from increase productivity as the land area under wheat is not expected to expand. About one third of the developing world's wheat (*Triticum aestivum* L.) area is located in environments that are regarded as marginal for wheat production because of drought, heat and edaphic factors. Despite these limitations, the world's dry and difficult cropping environments are increasingly crucial to food security in the developing world. For example, it has been reported that 32% of the 99 million hectares of wheat grown in developing countries experiences varying levels of drought stress (Rajaram *et al.*, 1996) [11]. It is well known that water management is one of the major factors responsible for achieving better harvest in crop production. As more than 90% of the water is used for irrigation. Priority should be fixed for higher WUE in the field. Since water is a precious and scare input and hence it must be judiciously used. It plays a vital role for assured crop production. Without water either through irrigation or rain, plant growth and development will be adversely affected. Since it is essential for the maintenance to turgidity, absorption of nutrients and the metabolic process of the plants. Therefore, it becomes imperative to find out appropriate irrigation schedule in order to maintain the availability of soil moisture throughout the growing season for exploiting yield potential. Among the several recognized criteria of irrigation scheduling, the climatological approach is very scientific and has been identified widely among the scientists and research workers throughout the world. It is well known that evapo-transpiration by a full crop cover is closely associated with the evaporation from an open pan (Dastane, 1967) [3]. Parihar *et al.* (1974) [10] suggested a relatively more practical meteorological approach of IW/CPE, the ratio between a fixed amount of irrigation water (IW) and cumulative pan evaporation minus rains

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 1533-1535

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 1533-1535
Received: 25-07-2018
Accepted: 30-08-2018

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

Anil Nishad
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh India

Correspondence
RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Importance of under variable moisture regimes on wheat (*Triticum aestivum* L.) cultivars

RK Aryan, AK Singh, SR Mishra, Rajan Chaudhari, Purusharth Katiyar, Nitish Kumar and Anil Nishad

Abstract
A field experiment was carried out at Agrometeorology Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season 2017 to study the "Importance of under variable moisture regimes on wheat (*Triticum aestivum* L.) cultivars.". The experiment consisted of 9 treatment combinations and tested in Randomized block design with three replications. Experiment consisted of three moisture regimes viz. 0.8 IW/CPE ratio, 1.0 IW/CPE ratio and 1.2 IW/CPE ratio and three wheat cultivars Viz. HUW-234, PBW-343 and NW-1012. Result reveal that moisture regimes of 0.8 IW/CPE ratio was found suitable for higher growth of wheat crop.

Keywords: wheat, moisture regimes, dry matter, LAI

Introduction
Wheat (*Triticum aestivum* L.) is a staple food of the world and belongs to family Poaceae. It is most important staple food of about two billion people (36% of the World population). About 55% of the world population depends on wheat for intake of about 20% of food calories. Wheat is self-pollinated crop and it has been described as the 'King of cereals'. In India, it is grown in an area of 30.47 million hectare, production 95.85 million tone's with a productivity of 3.15 tonnes per hectare. Uttar Pradesh having first rank in respect of both area (9.95 million hectare) and production (30.24 million tone's) with a productivity of 3.10 tone's per hectare in 2015 (Anonymous 2015) [1]. Irrigation in wheat can be scheduled mainly by three approaches *viz.*, soil moisture depletion approach, climatic approach (IW/CPE ratio) and physiological growth stage. Among them the climatological approach is very scientific and useful which has been widely recognized among the scientists and research workers throughout the world. It is well known that evapo-transpiration by a full crop cover is closely associated with evaporation from an open pan (Dastane, 1967) [2]. (Parihar *et al.* 1974) [3] Suggested a relatively more practical meteorological approach of IW/CPE. The ratio between fixed amount of irrigation water (IW) and CPE are a basis for irrigation scheduling of crops. Temperature below or above normal alter plant functions and productivity. In late sown wheat, low temperature prevailing during germination substantially affects the germination and seedling emergence. Germination is a critical process, as temperature below 12 °C result in poor and uneven emergence (Timmermans *et al.*, 2007) [6]. Therefore, the rate of emergence and final emergence percentage are important factors in determining the crop potential in various temperature of wheat production. In late sowing season, temperature of soil can be expected to be below 10 °C, which affects the seed germination and stand establishment. However mid-season sowing of winter wheat for any locality is usually most favourable, whereas late sown wheat suffers more winter injury, which produces fewer tillers and may ripen in lower grain weight and number of grains per plant (Razzaq *et al.*, 1986) [4]. The genotypic response of wheat to planting dates varies for yield contributing characters due to different genetic potential. The decline becomes prominent in the cultivars requiring more days for heading under normal planting. Increase in temperature cause shortens of heading period (Tashiro & Wardlaw, 1999) [5]. Similarly, cultivars matured earlier when planted late, indicating the forced maturity due to high temperature.

Materials and Methods
An experiment was conducted during Rabi 2017 at the Agrometeorology Research Farm of N.D. University of Agriculture& Technology, Kumarganj, Faizabad (U.P.) on the topic entitled "Importance of under variable moisture regimes on wheat (*Triticum aestivum* L.) cultivars." The experimental site is located in the main campus of NDUA&T, Kumarganj

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 2274-2277

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 2274-2277
Received: 09-07-2018
Accepted: 10-08-2018

Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Anil Nishad
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad,

Effect of energy requirement on growth and yield at Rabi maize (*Zea mays* L.) on various moisture regimes

Purusharth Katiyar, AK Singh, SR Mishra, Rajan Chaudhari, RK Aryan, Nitish Kumar and Anil Nishad

Abstract
A field experiment was carried out at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season of 2016-17 to study the "Effect of energy requirement on growth and yield at Rabi maize (*Zea mays* L.) on various moisture regimes." The experiment comprised of nine treatment combinations and conducted in Split plot design and replicated four time. Experiment consisted of three crop growing environment viz. 60x 20 cm spacing, 60 x 25 cm and 60 x 30 cm spacing were kept in main plots with three moisture regimes Viz. 0.6 IW/CPE ratio, 0.9 IW/CPE ratio and 1.2 IW/CPE ratio were kept in sub plot. Result reveal that Crop growing Environment of 60x20 cm spacing (83,333 plants/ha) was found suitable for optimum growth and yield of Rabi maize. Among crop growing environment, sowing done at 60x20 cm spacing recorded higher days taken from sowing to maturity while among moisture regime 1.2 IW/CPE ratio recorded higher days taken from sowing to maturity. Moisture regimes of 1.2 IW/CPE ratio was found suitable for higher growth and yield of Rabi maize. Crop growing Environment of 60x20 cm spacing and Moisture regimes of 1.2 IW/CPE ratio recorded higher heat use efficiency from sowing to maturity of Rabi maize.

Keywords: Maize, dry matter GDD, HUE, yield

Introduction
Maize (*Zea mays* L.) is an ideal crop owing to its quick growing habit, high yielding ability, palatability and nutritious ness. It can be grown in any season and is one of the most important cereal crop of the world human and feed for animals. Maize is very efficient utilizer of solar energy and has immense potential for higher yield. Each climatic zone has its own characteristics and as such different hybrids, composites and local varieties maturing in 60 to 150 days are being grown (Jain *et al.*, 1981) [3]. It can be fed to cattle at any stage, as there is no problem of poisoning to cattle with HCN or oxalic acid in plant unlike sorghum and therefore it is called as Queen of cereals and King of fodder. The father of green Revolution Renowned Nobel Laureate Dr. Norman E. Borlaug, has mentioned maize as the crop of future. In future maize can play vital role in ensuring food security as well as nutritional security by use of quality protein maize for the country as well as world as a whole. In Maharashtra, maize is principally a rainy season crop but the climatic variability and eco-physiological limitations are the major constraints to achieve potential yield of maize in traditional rainfed *kharif* season in the state. Recent studies conclusively proved that maize is a potential winter season crop having three times higher yield potential than *kharif* crop (Desai and Deore, 1980; Nayak *et al.*, 1987) [2, 5]. Water and nutrient is the key factor to increase the productivity of this crop. In India, maize is grown in diverse environments-from the dry area of Chitradurga, Karnataka to the warm wet plateau of Chindwara, (M.P). Since maize is largely grown under rainfed conditions during the rainy season, the crop is sown with the onset of the monsoon. Sowing window of maize occurs during Ist fortnight of June to the Ist fortnight of July depending upon the onset of the monsoon. Maize yields during the winter season are higher than during the rainy season. During winter, maize enjoys a favorable environment of cool temperatures, clear sky and higher solar radiation interception with less nutrient losses; less infection of insect pests and thereby better yields (Joshi *et al.*, 2005) [4]. Winter maize crop which makes the best use of low temperature and sunshine hours has longer growth duration of about 150-170days than 100-120 days under *Kharif* crop. As such in winter it synthesizes more food material resulting in higher yields. Yield obtained in *Rabi* season is invariably higher (>6t/ha) than the *Kharif* season yield (2-2.5t/ha). In the world, maize occupies an area of 185.12 million

International Journal of Chemical Studies 2018; 6(5): 2007-2010

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(5): 2007-2010
© 2018 IJCS
Received: 04-07-2018
Accepted: 08-08-2018

Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Purusharth Katiyar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Phenological growth and development of Rabi maize (*Zea mays* L.) under various moisture regimes

Purusharth Katiyar, AK Singh, SR Mishra, AN Mishra, Rajan Chaudhari, RK Aryan and Nitish Kumar

Abstract
A field experiment was carried out at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season of 2016-17 to study the "Phenological growth and development of Rabi maize (*Zea mays* L.) under various moisture regimes." The experiment comprised of nine treatment combinations and conducted in Split plot design and replicated four time. Experiment consisted of three crop growing environment viz. 60x 20 cm spacing, 60 x 25 cm and 60 x 30 cm spacing were kept in main plots with three moisture regimes Viz. 0.6 IW/CPE ratio, 0.9 IW/CPE ratio and 1.2 IW/CPE ratio were kept in sub plot. Result reveal that crop growing environment, sowing done at 60x20 cm spacing recorded higher days taken from sowing to maturity while among moisture regime 1.2 IW/CPE ratio recorded higher days taken from sowing to maturity. Moisture regimes of 1.2 IW/CPE ratio was found suitable for higher growth and development of Rabi maize.

Keywords: maize, phenophases, LAI, yield attribute

Introduction

Maize (*Zea mays* L.) belongs to family poaceae is one of the most important cereal crop in the world after wheat and rice. The importance of maize lies in its wide industrial applications besides serving as human food and animal feed. Maize is called 'queen of cereal' as it grown throughout year due to its photo-thermo-insensitive character and highest genetic yield among the cereals. Being a C_4 plant, it is very efficient in converting solar energy in to dry matter. Over 85% of maize produced in the country is consumed as human food. Green cobs are roasted and consumed by people with great interest. Maize seed contains 10% protein, 4% oil and 2-3% crude fiber. Several food dishes including chapaties are prepared out of maize flours and grains. Green maize plants are used as succulent fodder. Popping the corn is a method of starch cookery. Maize is a raw material for a number of products viz., starch, glucose, dextrose, sorbitol, dextrine, high fructose syrup, maltodextrine, germ oil, germ meal, fiber rand gluten products which have application in industries such as alcohol, textile, paper, pharmaceuticals, organic chemicals, cosmetics and edible oil. Maize has got very high yield potentiality and wide adaptability under various agro climatic conditions than any other cereal crops (Singh, 2013) [6]. The cultivation of winter maize was started in 1983-84 with the introduction of cold resistant varieties (Khehra and Dhillon 1984) [1]. The main idea was to give impetus to maize production because winter maize had high yield potential due to low incidence of insect-pest and diseases, lodging tolerance as compared to kharif season crop (Lal *et al* 2000) [3]. However, the practice of growing winter maize also could not catch up with the farmers due to its variable response to suboptimal temperatures, chilly winds and frequent incidences of frost in early period of growth in different areas of Punjab. Therefore, the Punjab Agricultural 2 University has also recommended maize sowing in the month of August. August sown maize has significantly lower maize borer attack, higher monetary returns (Srinivasulu *et al* 2008, Lal 1973) [7, 2], higher values of grain yield, stover yield, gross returns, net returns, benefit: cost ratio and per day gross returns as compared to sown in June and July (Panchanathan *et al* 1992) [4]. Maize responds relatively better to management factors especially irrigation and nitrogen (Prasad *et al* 1987) [5]. Assured irrigation is an important

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 1078-1081

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 1078-1081
Received: 16-07-2018
Accepted: 18-08-2018

Amrendra Yadav
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Ramanand Patel
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Amrendra Yadav
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Effect of energy requirement on growth and development of mustard [*Brassica juncea* (L.)] cultivars at different phenological stages

Amrendra Yadav, AK Singh, Rajan Chaudhari, SR Mishra and Ramanand Patel

Abstract
A field experiment was conducted during *Rabi season* of 2014 on the topic entitled "Effect of energy requirement on growth and development of mustard [*Brassica juncea* (L.)] cultivars at different Phenological stages" in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). The experimental comprised of three planting geometry *viz.*, 40×15cm, 40×20cm, 40×25cm and three varieties *viz.*, Varuna, Vardan and NDR-8501. Highest Thermal use efficiency was recorded when sowing was done on 40×15cm planting geometry, followed by sowing done on 40×20cm. NDR-8501 variety was found more conducive for growth development, grain yield and thermal use efficiency. Thermal unit (1659.4^{0}days), Photo thermal index (129.64), from sowing to maturity produced the high yield of Indian mustard.

Keywords: GDD, TUE, APAR, RUE, PTI

Introduction
Indian mustard (*Brassica juncea* L.) is an important oilseed crop belong to family cruciferae. The oilseed crop play an important role in agriculture economy of India. Our country is the largest oil economy in the world after the U.S., China and Brazil in term of vegetable oil. India occupies the second position in area after China and third position in production in the world after China and Canada. In India, during year 2012-2013, the area of Rapeseed-mustard was 67.17 lakh ha. With the production of 72.62 lakh mt. and productivity of 10.81 quintal/ha. In U.P during the year 2013-14 the area of rapeseed-mustard was 6.5 lakh ha. With the production of 7.8 lakh mt. and productivity of 12.08 quintal/ha (Anonymous, 2013-14) [1]. An option of suitable crop management practices are important factors for improving crop productivity. Sowing time has profound effect on growth and yield of mustard (Pawar *et al.*, 1976) [8]. Sowing dates and crop geometry are the two foremost non-monetary inputs of production can be manipulated to increase the crop productivity. Since information on sowing dates and crop geometry of Indian mustard. Climate change has increased the intensity of heat stress and heat stress due to increased temperature is an agricultural problem in many areas in the world as well as in India (Beck *et al.*, 2007) [2]. Transitory or constantly high temperatures cause an array of morphological, physiological and biochemical changes in plants (Serraj *et al.*, 1999, Moradshahi *et al.*, 2004) [9, 7].

Materials and Methods
The present investigation entitled "Effect of energy requirement on growth and development of mustard [*Brassica juncea* (L.)] cultivars at different Phenological stages" was conducted at Instructional Farm of Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad (U.P.) during *Rabi* season of 2014. The farm is located 42 Km away from Faizabad city on Faizabad- Raebareily road at 26°47 N latitude and 82°12 E longitude and about 113 meters above the mean sea level. The experiment was conducted in Randomized Block Design (RBD). The different growth parameters studied were measured as Heat unit/ Thermal unit (GDD), Thermal use efficiency (g/m^{-2}/^{0}days), APAR (MJ/m^2), Radiation use efficiency (g/MJ), Photo thermal Index.

Results
Heat unit/ Thermal unit (GDD) of Indian mustard at different Phenophases as affected by planting geometry and varieties have been presented in Table-1. The maximum heat Unit

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 1312-1314

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 1312-1314
Received: 14-07-2018
Accepted: 15-08-2018

Anil Nishad
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Anil Nishad
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad

Effect of heat use efficiency and thermal unit at different phenophases of rice (*Oryza sativa* L.) cultivars

Anil Nishad, AN Mishra, SR Mishra, AK Singh, Rajan Chaudhari, Nitish Kumar and RK Aryan

Abstract
A field experiment was conducted during kharif season of 2017 on the topic entitled "Effect of heat use efficiency and thermal unit at different phenophases of rice (*Oryza sativa* L.) cultivars." in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). The experiment consisted of nine treatment combinations comprised of three transplanting dates viz., July 5th, July 15th and July 25th and three varieties viz., NDR-97, NDR-3112 and BPT-5204. Results reveal that Highest Heat use efficiency (HUE) was recorded in growing environment of July 25th transplanting at all the stage followed by July 15th and July 5th transplanting while among the variety NDR-3112 recoded highest HUE followed by BPT-5204and NDR-97.

Keywords: Phenophases, HUE, thermal units

Introduction

Rice (*Oryza sativa* L.) is one of the important foods for most people living in India. It is being grown under diverse agro-climatic condition at wide range of latitudes. It is essential to human diet in India as it is a richest source of carbohydrates and adds the proteins component in human diet too. Generally 6.8% protein, 78.2% carbohydrates, 0.5% fat and 0.6% mineral matters are found in rice hence it is primarily used as a staple food crop. Rice production is influenced by a set of meteorological variables such as temperature, rainfall etc Ji, B. *et al.* (2007) [4]. The climate extremities, particularly high temperatures affect the plant growth and reduce the rice yield significantly Satake, T. and Yoshida, S. (1978) [7]. The crop growth response is influenced largely by the microclimate environment in the crop. Microclimate in the crop varies from top of the canopy to the soil surface and affects crop development and yield. Various environmental factors influencing crop growth are interception of photosynthetically active radiation, air and leaf temperatures, relative humidity, prevailing wind speed, CO2 concentration and soil moisture availability. Temperature and light play a key role in influencing the crop production. Thermal time is an independent variable to describe plant development Dwyer, L.M. and Stewart, D.W. (1986) [3]. It can be used as a tool for characterizing thermal responses in different crops. Knowledge of accumulated GDD can provide an estimate of harvest date as well as crop development stage Ketring, D.L. and Wheless, T.G. (1989) [5]. Heat use efficiency (HUE), i.e., efficiency of utilization of heat in terms of dry matter accumulation, depends on crop type, genetic factors and sowing time and has great practical application Rao *et al.* (1999) [6]. Initiation as well as duration of crop phenophases is an essential component of weather based dynamic crop growth and yield simulation models. Crop phenology can be used to specify the most appropriate date and time of specific development process. The duration of each phenophase determines the accumulation and partitioning of dry matter in different organs Dalton, L.G. (1967) [2]. Wang, J.Y. (1960) [8] reported that the duration of a particular stage of growth was directly related to temperature and this duration of particular species could be predicted using the sum of daily air temperature. Temperature is an important environ- mental factor influencing the growth and development of crop plants. It influences the crop phenology and yield of crop Bishnoi *et al.* (1995) [1]. Plants have a definite temperature requirement to attain phenological stages. Hence, it becomes imperative to have knowledge of the exact duration of phenological stages in a particular crop-growing environment and their impact on yield of crop. In the present study, an attempt is made to predict the growth and yield of rice (*Oryza sativa* L.) with agroclimatic indices viz. growing degree days (GDD), heliothermal units (HTU), photothermal

International Journal of Chemical Studies 2018; 6(5): 1384-1387

International Journal of Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(5): 1384-1387
© 2018 IJCS
Received: 11-07-2018
Accepted: 15-08-2018

Vivesh Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

AN Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pardesh, India

Correspondence
SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Studies on production and potential yield of wheat in eastern plain zones of UP

Vivesh Singh, SR Mishra, AK Singh, Rajan Chaudhari, Nitish Kumar and AN Mishra

Abstract
The experimental site is located at the main campus of university on the left side of Faizabad-Raibareilly road at a distance of 43 km away from Faizabad district headquarter. The local of experimental site lies between a latitude of 24^{0}47' and 26^{0}56' N and longitude of 82^{0}12' and 83^{0}98' E and an altitude of 113 m mean sea level, in the genetic alluvium of eastern Uttar Pradesh. Comparisons were made between simulated data of various parameters viz., yield, total dry matter, LAI, soil moisture, test weight, harvest index, grain weight and their corresponding observed data through regression analysis. Measures of accuracy were worked out with coefficient of determination (R^2).The crop yield data for the respective districts as obtained from the reports of The Directorate of Agriculture, Government of U.P. were considered as actual yield for the respective district which was nothing but the average of the district yield data collected from farmers' fields in the district concerned.

Keywords: wheat, LAI, PI, yield component

Introduction
Wheat (*Triticum aestivum* L.) is one of the most important staple food crop cultivated in at least 43 countries and provides 20% of food calories to the mankind, covering 223.6 million hectares area and producing 690.0 million tones with an average productivity of 3.08 t/ha (Anon., 2010). The major wheat growing countries are USSR, USA, China, India, Canada, Australia, France, Turkey and Pakistan. In India, wheat is next to paddy in area and production and grown over an area of 27.75 million hectares with an annual production of 80.68 million tones. India rank second after China in wheat growing countries. It is considered to be the backbone of the food security in India. Wheat is cultivated in almost all the states of India, but its extensive cultivation is confined to Uttar Pradesh, Punjab, Haryana, Rajasthan, Madhya Pradesh and Gujarat. In semiarid and arid regions, there is increasing competition for water resources between agricultural irrigation and other ecological water uses due to a growing population (Molden, 1997) [15]. Efficient management of water resources in agriculture is needed to balance water supply and demand (Ines *et al.*, 2002) [10]. In the last 20 yr, irrigation planning methods have switched from the allocation approach, e.g., based on socio-political considerations, to quantitative management (Raman *et al.*, 1992) [16]. The development of mathematical models is a fundamental step to guide quantitative irrigation. Th e accurate estimation of temporal and spatial variations in soil moisture, evaporation, and transpiration is crucial to determine the availability of water resources (Aggarwal, 1995; Addiscott *et al.*, 1995) [3, 2] and sustainable management of limited water resources in arid and semiarid regions (e.g., Garatuza-Payan *et al.*, 1998) [8]. Simulation models of crop physiological growth are widely accepted tools for field study of efficient and sustainable water use in agricultural production in various agro-ecological zones. Such models can aid in understanding the interactions between crops and environments (Kropff and Goudriaan, 1994; Yin *et al.*, 2004) [13, 17] and provide optimal agricultural management strategies under uncertain weather conditions and climatic change (Meinke *et al.*, 2001; Booltink *et al.*, 2001; Kersebaum í 2002) [14, 6, 12]. Several crop physiological growth models (e.g., Simple and Universal Crop Growth Simulator [SUCROS] and ORYZA [Goudriaan and van Laar, 1994] [9]; World Food Studies [WOFOST; Boogaard *et al.*, 1998]; Decision Support System for Agrotechnology Transfer [DSSAT; Jones *et al.*, 2003] [11] have been developed from photosynthesis modeling based on the complex biochemical approach (Farquhar *et al.*, 1980) [7], the constant light use efficiency

Journal of Pharmacognosy and Phytochemistry 2018; 7(5): 1425-1428

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 1425-1428
Received: 10-07-2018
Accepted: 12-08-2018

Vivesh Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Chaudhari
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Nitish Kumar
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Narendra Nagar, Kumarganj, Faizabad, Uttar

Simulation of wheat (*Triticum aestivum* L.) yield using WOFOST model under different management levels

Vivesh Singh, SR Mishra, AK Singh, Rajan Chaudhari, Nitish Kumar and AN Mishra

Abstract
A field experiment was conducted at Agrometeorology Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi season 2012 and 2013 to study the "Simulation of wheat (*Triticum aestivum* L.) Yield using WOFOST model under different management levels". The experiment consisted of 12 treatment combinations in tested Split plot design with three replications. Experiment consisted of three irrigations at different stage i.e. First Irrigations (CRI+ Tillering+ Ear Head Emergence +Milking, Second irrigation (CRI+ Ear Head Emergence + Milking) and Third irrigation (CRI+ Milking) and two date of sowing i.e. first is normal sowing (15 November) and second is delayed sowing (15 December) and two fertilizer doses higher dose (150:75:75 NPK kg ha^{-1}) and optimum dose (120:60:60 NPK kg ha^{-1}). Sensitivity of WOFOST model simulated grain yield to incremental units of maximum air temperature showed a gradual decrease in yield while, the down scaled maximum temperature increased the yield. The wheat yield increased due to decreased temperature ranged 5.7 to 25.4. While the reduction of yield due to increase of temperature from -8.8 to 26.3.Every 1^0C decrease in the minimum temperature increased the grain yield of wheat was 5.6, 12.1, 19.4, 23.9 and 26.8 respectively while increase in temperature from 1^0C to 5^0C wheat yield decrease from -11.0 to 37.9 percent.

Keywords: Wheat, WOFOST model, irrigation levels, CO_2 levels

Introduction

In crop growth modeling schemes, the various components of the water balance in an agro ecological system are the most important physical and physiological factors for calculations (Aggarwal, 1995; Addiscott *et al.*, 1995) [2, 1]. Spatial and temporal variation of soil moisture is one of the main causes of crop production variation (Shepherd *et al.*, 2002; Anwar *et al.*, 2003; Patil and Sheelavantar, 2004) [9]. Meanwhile, actual evaporation and transpiration, which determine the soil moisture profile, are the main processes for water loss in a soil–plant system (Burman and Pochop, 1994; Monteith and Unsworth, 1990) [3, 7]. Crops can only absorb the soil moisture present within reach of their roots. These processes could be represented in hydrologic models. Therefore, the coupling of hydrologic and crop growth models connects hydrology and agronomy quantitatively and provides a bridge across the boundaries of the two subjects. In the last several years, numerous studies have been conducted to understand the complex interactions between ecological systems and the hydrologic cycle, resulting in the development of ecohydrologic models and soil–plant–atmosphere models (Smettem, 2008) [10]. Simulation modeling can be used to understand the relationships among crop production, groundwater recharge, soil evaporation, and crop transpiration (Engel and Priesack, 1993) [5]; used a numerical model to evaluate groundwater recharge in an irrigated cropland. By coupling hydrologic and crop growth models, (Eitzinger *et al.* 2004) [4] studied soil water movement during crop growth stages and concluded that the coupled modeling approach was better than a single-model method. A few studies have been conducted to investigate the effects of the soil moisture distribution along a vertical soil profile during crop transpiration (e.g., Varado *et al.*, 2006) [11]. The model coupling studies have generally focused on the effect of crop growth on soil moisture, and much less attention has been paid to improving crop growth models by properly modelling the root growth algorithm and root water uptake. In this study, we developed a modeling approach to simultaneously estimate crop production, soil moisture dynamics, evaporation, and transpiration by coupling HYDRUS with WOFOST. The soil moisture dynamic movements are simulated through the Richards equation (in the HYDRUS model), while root water uptake and transpiration are calculated according to the

Int.J.Curr.Microbiol.App.Sci (2018) 7(9): 3811-3816

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 09 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.709.471

Consumptive Use, Water Use Efficiency and Economics of *Rabi* Maize as Influenced by Planting Geometry and Moisture Regimes

K. K. K. Reddy[1*], A. K. Singh[2] and R. S. Singh[2]

[1]*Department of Agronomy, PJTSAU, Hyderabad, Rajendranagar-500030, India*
[2]*Department of Agronomy, NDUAT, Kumarganj-224229, India*

**Corresponding author*

Keywords

Rabi maize, Planting geometry, Irrigation, IW/CPE ratio, Moisture regimes, Consumptive use, Water use efficiency, Economics

Article Info

Accepted:
04 August 2018
Available Online:
10 September 2018

A B S T R A C T

Field experiment was conducted at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi 2016-2017 on silty loam soils to study the "Consumptive use, Water use efficiency and Economics of Rabi Maize as Influenced by Planting geometry and Moisture regimes". The experiment was laid out in split plot design with four planting geometriesviz., 60× 10 cm, 60 × 15 cm, 60 × 20 cm, 60 × 25 cm and four moisture regimes viz., 0.6 IW/CPE ratio, 0.9 IW/CPE ratio, 1.2 IW/CPE ratio, 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for rest of the crop season which were replicated thrice. Results showed that Consumptive use (cm) was more in 60 x 10 cm spacing and 1.2 IW/CPE ratio. Maximum WUE was recorded in 60 × 25 cm spacing and 1.2 IW/CPE ratio. The highest gross return, net return and benefit-cost ratio were recorded with60 × 25 cm planting geometry and 1.2 IW/CPE ratio.

Introduction

Maize (*Zea mays* L.) belongs to family poaceae is one of the most important cereal crop in the world after wheat and rice. Maize is called 'queen of cereal' as it is grown throughout the year due to its photo-thermo-insensitive character and highest genetic yield among the cereals. Being a C_4 plant, it is very efficient in converting solar energy in to dry matter. Importance of maize lies in its wide industrial applications besides serving as human food and animal feed. In the world, maize occupies an area of 185.12 million hectares with a production of 872.06 million tonnes and with a productivity of 4.9 t ha^{-1}. In India, maize is cultivated in an area of 8.49 million hectares, with a production of 21.28 million tonnes and with a productivity of 2.5 tha^{-1}.*Rabi* maize is grown in an area of 1.2 million hectares with the production of 5.08 million tonnes, with an average productivity of 4.00 t/ha.

It is traditionally a rainy season crop in India and is extensively grown as an important *kharif* crop under rainfed or irrigated condition, but *Kharif* crop suffers due to vagaries of monsoon, excessive rainfall leading to water stagnation, poor drainage, erratic and insufficient rainfall leading to moisture stress condition, severe infestation of

Int.J.Curr.Microbiol.App.Sci (2018) *7*(9): 3828-3836

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 09 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.709.373

Yield Attributes of *Rabi* Maize as Influenced by Planting Geometry and Moisture Regimes

K. K. K. Reddy[1*], A. K. Singh[2] and R. S. Singh[2]

[1]*Department of Agronomy, PJTSAU, Hyderabad, Rajendranagar-500030, India*
[2]*Department of Agronomy, NDUAT, Kumarganj-224229, India*

**Corresponding author*

Keywords

Rabi maize, Planting geometry, IW/CPE ratio, Moisture regimes, yield attributes

Article Info

Accepted:
28 August 2018
Available Online:
10 September 2018

ABSTRACT

A field experiment was conducted during *rabi* 2016-2017 on silty loam soils at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) to study the "Yield Attributes of *Rabi* Maize as Influenced by planting geometry and Moisture regimes". The experiment was laid out in split plot design with four planting geometries *viz.*, 60× 10 cm, 60 × 15 cm, 60 × 20 cm, 60 × 25 cm and four moisture regimes *viz.*, 0.6 IW/CPE ratio, 0.9 IW/CPE ratio, 1.2 IW/CPE ratio, 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for rest of the crop season which were replicated thrice. Results showed that higher Length of cob, No of grain rows per cob, No of grains per row, No of grains per cob, weight of cob, weight of grains per cob, Girth of cob, Test weight, shelling percentage, grain yield and stover yield was found in 60 × 25 cm spacing and 1.2 IW/CPE ratio.Interactive effect of planting geometry and moisture regimes on yield attributes under study were found to be non-significant.

Introduction

Maize (*Zea mays* L.) belongs to family poaceae is one of the most important cereal crop in the world after wheat and rice. Maize is called 'queen of cereal' as it is grown throughout the year due to its photo-thermo-insensitive character and highest genetic yield among the cereals. Being a C_4 plant, it is very efficient in converting solar energy in to dry matter. Importance of maize lies in its wide industrial applications besides serving as human food and animal feed. In the world, maize occupies an area of 185.12 million hectares with a production of 872.06 million tonnes and with a productivity of 4.9 t ha^{-1}. In India, maize is cultivated in an area of 8.49 million hectares, with a production of 21.28 million tonnes and with a productivity of 2.5 tha^{-1}. *Rabi* maize is grown in an area of 1.2 million hectares with the production of 5.08 million tonnes, with an average productivity of 4.00 t/ha. It is traditionally a rainy season crop in India and is extensively grown as an important *kharif* crop under rainfed or irrigated condition, but *Kharif* crop suffers due to vagaries of monsoon, excessive rainfall leading to water stagnation, poor drainage, erratic and insufficient rainfall leading to moisture stress condition, severe infestation of pests and diseases, fertilizer losses, greater weed menace and high temperature

Int.J.Curr.Microbiol.App.Sci (2018) 7(9): 3817-3827

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 09 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.709.472

Agro-Physiological Attributes of *Rabi* Maize as Influenced by Planting Geometry and Moisture Regimes

K. K. K. Reddy[1*], A. K. Singh[2] and R. S. Singh[2]

[1]*Department of Agronomy, PJTSAU, Hyderabad, Rajendranagar-500030, India*
[2]*Department of Agronomy, NDUAT, Kumargunj-224229, India*

**Corresponding author*

Keywords

Rabi maize, Planting geometry, IW/CPE ratio, Moistureregimes, Agro-physiological attributes

Article Info

Accepted:
28 August 2018
Available Online:
10 September 2018

ABSTRACT

A field experiment was conducted during *rabi* 2016-2017 on silty loam soils at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) to study the "Agro-physiological attributes of maize as influenced by Planting geometry and Moisture regimes". The experiment was laid out in split plot design with four planting geometries *viz*., 60× 10 cm, 60 × 15 cm, 60 × 20 cm, 60 × 25 cm and four moisture regimes *viz*., 0.6 IW/CPE ratio, 0.9 IW/CPE ratio, 1.2 IW/CPE ratio, 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for rest of the crop season which were replicated thrice. Results showed that higher plant height (cm) and leaf area index (LAI) at harvest was recorded with 60 × 10 cm planting geometry and 1.2 IW/CPE ratio which was statistically at par with 60 × 15 cm and 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for the rest of the crops season. Dry matter accumulation (g m^{-2}), stem girth (cm) at harvest was higher in 60 × 25 cm and 1.2 IW/CPE ratio which was at par with 60 × 20 cm and 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for the rest of the crop season. Number of days taken for 75% tasselling, silking and maturity was lower with 60 × 25 cm and 1.2 IW/CPE ratio while higher with 60 × 10 cm and 0.6 IW/CPE ratio. Interactive effect of planting geometry and moisture regimes on Agro-physiological attributes under study were found to be non-significant.

Introduction

Maize (*Zea mays* L.) belongs to family poaceae is one of the most important cereal crop in the world after wheat and rice. Maize is called 'queen of cereal' as it is grown throughout the year due to its photo-thermo-insensitive character and highest genetic yield among the cereals. Being a C_4 plant, it is very efficient in converting solar energy in to dry matter. Importance of maize lies in its wide industrial applications besides serving as human food and animal feed. In the world, maize occupies an area of 185.12 million hectares with a production of 872.06 million tonnes and with a productivity of 4.9 t ha^{-1}.

In India, maize is cultivated in an area of 8.49 million hectares, with a production of 21.28 million tonnes and with a productivity of 2.5 tha^{-1}. *Rabi* maize is grown in an area of 1.2 million hectares with the production of 5.08 million tonnes, with an average productivity of 4.00 t/ha.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(6): 844-846
Received: 07-09-2019
Accepted: 09-10-2019

KKK Reddy
Ph.D. Scholar, Dept. of Agronomy, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

AK Singh
Dept. of Agronomy, NDUAT, Kumarganj, Uttar Pradesh, India

RS Singh
Dept. of Agronomy, NDUAT, Kumarganj, Uttar Pradesh, India

Corresponding Author:
KKK Reddy
Ph.D. Scholar, Dept. of Agronomy, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Water productivity of *rabi* maize (*Zea mays* L.) as influenced by planting geometry and moisture regimes

KKK Reddy, AK Singh and RS Singh

Abstract
A field experiment with maize was conducted during *rabi* 2016-2017 on silty loam soils at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.). The experimental design was split plot design with three replicates. The objective of this study was to determine the effect four planting geometry *viz.*, 60 × 10 cm, 60 × 15 cm, 60 × 20 cm, 60 × 25 cm and four moisture regimes *viz.*, 0.6 IW/CPE ratio, 0.9 IW/CPE ratio, 1.2 IW/CPE ratio, 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for rest of the crop season on water productivity of *rabi* maize. Among the planting geometry, highest irrigation water productivity (1.01 kg/m^3), input water productivity (0.98 kg/m^3) and real water productivity (1.29 kg/m^3) was recorded in 60 × 25 cm, while the lowest irrigation water productivity (0.88 kg/m^3), input water productivity (0.85 kg/m^3) and real water productivity (1.00 kg/m^3) was recorded in 60 × 10 cm. With respect to different moisture regimes tried highest irrigation water productivity (1.36 kg/m^3), input water productivity (1.30 kg/m^3) and real water productivity (1.40 kg/m^3) was recorded in 0.6 IW/CPE ratio, while the lowest irrigation water productivity (0.83 kg/m^3), input water productivity (0.81 kg/m^3) and real water productivity (1.01 kg/m^3) was recorded in 1.2 IW/CPE ratio.

Keywords: Water productivity, *rabi* maize, planting geometry, IW/CPE ratio, moisture regimes

Introduction
Maize (*Zea mays* L.) is the third most important grain crop in India after rice and wheat with respect to area and productivity. Globally maize is cultivated in an area of 177 million hectares with a production and productivity of 989 and 5.5 metric t ha^{-1}, respectively (Commodity profile-maize, 2015) [1]. In India it is grown in an area of 9.43 million hectares with production of 24.35 Mt and 2562 kg ha^{-1} productivity (CMIE, 2016) [5]. It has wide ecological adaptability and is grown in extreme semi-arid to sub-humid and humid regions as a staple crop for human beings, feed for animals and as a basic raw material for production of starch, oil, protein, alcoholic beverages, food sweeteners and more recently bio-fuel (Dass *et al.*, 2008) [2]. The average grain yield of maize is not only substantially lower compared with other important maize growing countries but also less than the production potential of existing genotypes. Traditionally maize is a rainy/*kharif* season crop in India and is extensively grown under rainfed conditions, but *kharif* crop suffers due to vagaries of monsoon, excessive rainfall leading to water stagnation, poor drainage, erratic and insufficient rainfall leading to moisture stress condition, severe infestation of pests and diseases, fertilizer losses, greater weed menace and high temperature throughout the growth period which tend to reduce grain yield. On the contrary, the risk of damage to the crop from excessive rainfall, water stagnation, inadequate soil moisture, pest and disease infestation during winter/*rabi* season is less. The average grain yield of maize is not only substantially lower compared with other important maize growing countries but also less than the production potential of existing genotypes. Low yield of maize is due to many constraints but among them, cultivation of local genotypes, imbalanced use of fertilizers, traditional sowing methods, improper water management, lack of optimal crop stand and optimum planting geometry are the factors of prime importance. Planting geometry and water management play an important role in enhancing the crop productivity. Planting geometry *i.e.* plant population per unit area have immense role since it is a non tillering crop. Sub optimal plant stand *i.e.* wider spacing leads to poor yield per unit area. While higher plant populations have greater competition for growth resources and leads to poor yield. In order to produce higher yields of maize, optimum soil moisture should be maintained as it is susceptible to both water logging and water deficit. Among the different approaches for scheduling, the climatological approach based on IW/CPE ratio (IW - irrigation water, CPE - cumulative pan evaporation) has been found most appropriate as it integrates all weather

Indian Journal of Agronomy 64 (2): 253–256 (June 2019)

Research Paper

Bio-efficacy of pre-and post-emergence herbicides for weed management in Japanese mint (*Mentha arvensis*)

A.K. SINGH[1], JAIDEV SHARMA[2], A.N. MISHRA[3] AND R.P. SINGH[4]

Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224 229

Received : March 2017; Revised accepted : May 2019

ABSTRACT

A field experiment was conducted during the summer season of 2014 and 2015 at Kumarganj Faizabad, Uttar Pradesh, to evaluate the effect of different herbicides on growth and yield of Japanese mint (*Mentha arvensis* L.) and associated weeds. The experiment was conducted in a randomized block design with 3 replications. There were 10 treatments, comprising pendimethalin 1,000 g/ha, oxyfluorfen 200 g/ha, oxyfluorfen 250 g/ha, pendimethalin 1,000 g followed by (fb) clodinafop 60 g/ha, pendimethalin 1,000 g fb imazethapyr 50 g/ha, pendimethalin 1,000 g fb clodinafop 60 g fb imazethapyr 50 g/ha, metribuzin 490 g/ha, metribuzin 700 g/ha, weed-free, weedy check. The soil was silt loam in texture with low in organic carbon, nitrogen, phosphorus and medium in potash. The Japanese mint variety 'Kashi' was used @ 400 kg/ha in rows, 45 cm apart. Application of pre-emergence (PE) pendimethalin 1,000 g/ha and post-emergence (PoE) of clodinafop 60 g/ha followed by imazethapyr 50 g/ha resulted in the highest weed-control efficiency (83.69%) at harvesting stage. Post-emergence application of imazethapyr 50 g/ha resulted in 80–90% control of broad-leaf weeds, but it produced toxic effect on the crop. Among the weed-control treatments, pendimethalin 1,000 g/ha as a PE fb PoE of clodinafop 60 g/ha, exhibited higher benefit: cost ratio 2.60 over the other treatments, which proved to be more remunerative and economical to the farmers.

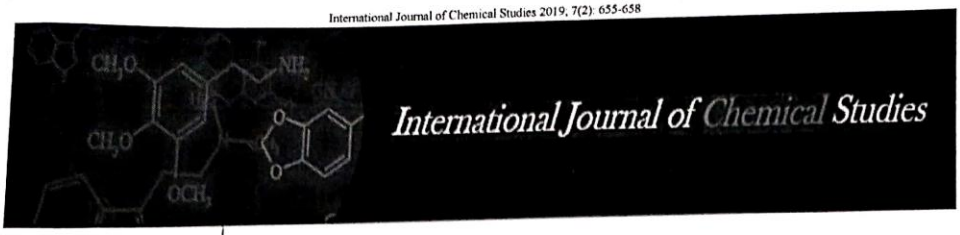
Key words: Bioefficacy, Herbicides, Japanese mint, Post-emergence, Pre-emergence

Japanese mint is grown for medicinal and aromatic purposes. It is a long-lasting, quick-growing, hairy leaved herb that can even attain a height of 1.5 m if favourable condition are provided. The oil of this plant is extremely useful in various industries, viz. food industry, pharmaceutical industry and also in a perfumery and flavouring industries. Japanese mint oil is often required by the medicine industry and, it is used in balm, cough drops, inhalers, toothpaste, mouthwash etc. With the steam-distillation process, mint oil is extracted from the fresh plant foliage. Major growing countries of mint are India, China, and Brazil. In India, the major mint-producing states are Uttrakhand, Punjab, Haryana, Bihar and Uttar Pradesh etc. India contributes about 73% of total mint oil production of the world and rest by China and Brazil.

Yield per unit area as well as oil content in herb of Japanese mint are much lower in India as compared to other countries. One of the major factor responsible for low yield is improper control of weeds. The crop is infested with a number of weeds, viz. *Cyperus rotundus, Cynodon dactylon, Chenopodium album, Solanum nigrum, Euphorbia hirta, Anagallis arvensis, Echinochloa colonum, Eleusine indica* etc. These weeds caused 78 and 81% losses in first and second harvest of Japanese mint oil yield (Singh *et al.*, 1993; Kumar *et al.*, 2011). The crop requires frequent irrigations for quick sprouting and better growth which encourage the growth of weeds. The crop is planted in the end of January or beginning of February and remain in the field till September and provide 2 cuttings. Thus, the crop is affected with weeds of both winter and summer seasons. Due to poor initial growth rate, field is usually dominated by the weeds, resulting in poor quality and quantity of oil. The weeds can be controlled by cultural, mechanical and chemical methods. Due to timely unavailability of labours and their higher wages it becomes quite difficult to manage the weeds manually and hence use of the herbicides in controlling associated weeds becomes imperative. A number of herbicides, e.g. Pendimethalin, Oxyfluorfen and Metribuzin are being used to control the weeds in Japanese mint (Brar *et al.*, 2000). Now-a-days a number of high-potency herbicide

[1]**Corresponding author Email:** aksmausam@gmail.com
[1]Associate Professor, [2]Ex-Professor (Agronomy) [3,4]Assistant Professor, Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Ayodhya (U.P.)

International Journal of Chemical Studies 2019; 7(2): 655-658



P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(2): 655-658
© 2019 IJCS
Received: 07-01-2019
Accepted: 09-02-2019

Sarvesh Baranwal
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Sharma
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

DP Singh
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Sarvesh Baranwal
Department of Agricultural Meteorology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Evaluation of crop simulation modeling in chickpea crop using DSSAT model ver4.6

Sarvesh Baranwal, AN Mishra, AK Singh, SR Mishra, SK Sharma and DP Singh

Abstract
A field experiment was conducted during the *Rabi* season of 2017-18 to access the "Evaluation of crop simulation modeling in chickpea crop using DSSAT model ver4.6" in silty loam soil at student's instructional Farm, N.D. University of Agriculture & Technology, Kumarganj, Faizabad. The experiment was conducted with Randomized block design and replicated four times with nine treatment combinations consisted of three dates of sowing viz. D_1 (5th November), D_2 (15th November) and D_3 (25th November) and three cultivars *viz.* V_1 (BG-372), V_2 (KPG-59) and V_3 (Pant G-186). The historical crop data of year 2015-16 and 2016-17 were used for calibration of the model. The yield and yield attributes, phonological stages, test weight, harvest index as simulated by model were compared with the observed data. The result revealed that the model underestimated the test weight, LAI, first pod initiation, physiological maturity and overestimated rest of the parameters.

Keywords: Crop growth model, DSSAT, chickpea, simulation, calibration validation

Introduction

Chickpea (Cicer arietinum L.) is the premier pulse crop of Indian sub continent. India is the largest chickpea producer as well as consumer in the world. In UP its total area is 0.27 million hectare, production 0.22 million ton and productivity is 805kg/ha. The UN declared 2016 the 'international year of pulses'. (Agriculture Statistics, 2016-17).

It has the highest nutritional compositions in the form of fiber and mincrals. It can fix atmospheric nitrogen up to 140 kg/ha through its symbiotic association with Rhizobium and meets its 80 % requirement. It also helps in enhancing the soil quality for subsequent cereal crop. In India, acid exudates from the leaves were used medicinally for bronchitis, cholera, constipation, diarrhea, dysentery, snakebite, sunstroke and warts. The productivity of chickpea is curtailed due to biotic and abiotic stresses. Weather is one of the important factor, which affects all stages of chickpea growth and finally the yield (Abbo et al. 2005) [1]. The crop growth simulation models show considerable potential to evaluate crops, crop varieties, cropping pattern and genetic potential pattern for yield (Boote et al., 1987) [4]. In this paper attempt has been made to calibrate and validate to genetic coefficient of chickpea cultivar using DSSAT model.

Materials and Methods

Geographically the experimental site is situated at 26°47′ N latitude, 82°12′ E longitude and at an altitude of 113 meters above sea level in the Indo genetic alluvium of eastern Uttar Pradesh. The site comes under the subtropical climate and often subjected to extreme weather condition i.e. cold winter and hot summer. The experimental data (2017-18) of chickpea crop at Agro meteorological Research farm in the main campus of NDUA&T, Kumarganj, (Faizabad). Comprising three date of sowing (D_1-5 Nov, D_2-15 Nov, D_3-25 Nov) and three varieties (V_1-BG-372, V_2- KPG-59, V_3- Pant G-186). The package and practices for cultivation was followed as per the recommendation of crop parameters such as yield and yield attributes, LAI, harvest index and phenology were used for calibration of the DSSAT ver4.6 model. The genetic coefficient of chickpea were estimated by repeated interactions until a close match between simulated and observed phenology and yield was obtained in respective treatments. The values of genetic coefficients as derived from calibration of the model are the presented in Table1.

International Journal of Chemical Studies 2019, 7(3): 3289-3292

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 3289-3292
© 2019 IJCS
Received: 19-03-2019
Accepted: 23-04-2019

Sandeep Kumar Sharma
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

Sarvesh Baranwal
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

SK Shukla
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Sandeep Kumar Sharma
Department of agricultural meteorology, Narendra Deva University of Agriculture & Technology Kumarganj, Faizabad, Uttar Pradesh, India

Study the effect of crop weather interaction on the growth and development of rice genotypes

Sandeep Kumar Sharma, SR Mishra, AK Singh, AN Mishra, Sarvesh Baranwal and SK Shukla

Abstract
From a morphological point of view, we attempted to estimate rice (*Oryza sativa* L.) yields by multiplication of three yield components considering seasonal changes in meteorological conditions. A field experiment was conducted during *kharif season* of 2017-18 in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). The experiment consisted of nine treatment combinations comprised of three transplanting dates *viz.* July 5th, July 15th and July 25th and three varieties viz., NDR-97, NDR-3112 and BPT-5204. Results reveal that different phenophases of rice markedly varied with only dates of transplanting but also different weather variables which ultimately create the different crop growing environment to harvest the yield accordingly. Highest crop growth rate (CGR) was recorded in growing environment of July 5th due to occurrence of long duration. Highest Leaf are index and Plant height was recorded in Ist date of transplanting on July 5th at vegetative stage.

Keywords: LAI, plant height, CGR, RGR, harvest index

Introduction

The productivity of rice is largely affected by a set of weather variables among which rainfall, solar radiation and temperature play a significant role. Rice is one of the major crops feeding the world population and is most important ingredient in food composition in South Asia. It is most important cereal crop belong to the family Poaceae. It is the staple food for half of the world's population. Rice deserves a special status among cereals as world's most important wetland crop. (Gorantla *et al.,* 2005) [2].

Rice is an excellent source of carbohydrates and also rich in magnesium, thiamine, niacin, phosphorus, vitamin B_6, zinc and copper. Some varieties have iron, potassium and folic acid. Some varieties may provide 14g of protein per 100g. It is used for sweet dishes, for *risotto* in Italy, and many rice dishes, such as *arròsnegre*, in Spain. The challenge, above anything else, is to produce this additional rice with less land, less water, and less labour, in more efficient, environmentally-friendly production systems that are more resilient to climate change, among other factors. Uttar Pradesh is largest rice growing state after West Bengal in the country. Rice area with salt problem in state is estimated to be ≤ 2%. Inland salinity areas are mainly concentrated in Raibareilly, Azamgarh, Sultanpur, Faizabad, Lucknow, Unnao and Pratapgarh district. The area and production of rice in this state is about 5.87 million hectare and 12.22 million tonnes, respectively and productivity of 2082 kg per hectare (Anonymous, 2015-16) [1]. Among the crop production tools, proper time and method of sowing are the prerequisites that allow the crop to complete its life phase timely and successfully under a specific agro-ecology. In rice, the optimum leaf areas for seedlings, optimum leaf shapes to maximize photosynthetic efficiency, deep, well-developed root systems, leaf area index (LAI) at flowering and crop growth rate (CGR) during panicle initiation have been identified as the major determinants of yield. In environments with large temperature amplitudes, this effect should be considered when water-saving measures are applied in lowland rice fields. (Sun *et al.*, 1999) [4]. Climate change and its impact would emerge as a new challenge in near future, in addition to many challenges that are already present to achieve higher productivity in rice crop (Krishnan *et al.*, 2011) [3]. According to Zacharias *et al.* (2010), high temperature stress caused reduction in total dry matter, tiller mortality, reduced the number of panicles, grain per panicle, floret sterility and grain weight thus reducing the grain yield of rice. According to Waraich *et al.* (2012) [5] proper plant nutrition is one of the good strategies to alleviate the temperature stress

V

International Journal of Chemical Studies 2019, 7(1): 2014-2017

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 2014-2017
© 2019 IJCS
Received: 06-11-2018
Accepted: 10-12-2018

Arpita SN
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sachin Kumar Shukla
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manoj Kumar
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Arpita SN
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Studies on extreme weather events of eastern plain zone of Uttar Pradesh

Arpita SN, AK Singh, AN Mishra, Sachin Kumar Shukla and Manoj Kumar

Abstract
The historical daily data of rainfall and temperature were collected for the period of last 30 years (1985-2015) for the various extreme weather events *viz*, Dry spell, Wet spell, Heat waves, Cold waves, and frost as to identify the impact of various extreme weather events. Based on the historical data results reveal that. In EPZ of U.P, the dry spell showed an increasing trend in recent years. The wet spell of 10mm for 7 days, 25mm for 3 days showed decreasing trend in recent years. S-W monsoon rainfall of EPZ of UP declined over the normal in recent years. Maximum days of heat waves were recorded in May (1.6 days) followed by June (1.5days).During the month of September there was no any heat waves, while during the month of March followed by August recorded lowest frequency of heat waves. Maximum days of cold waves (1.6 days) were recorded during the month of January followed by February and December month. The month of October and March have no cold wave in EPZ of U.P. The trend of extreme minimum temperature and extreme maximum temperature showed decreasing trend against the normal value of 3°C and 44°C respectively.
The number of frost events increased from 29 days to 57 days, against the normal of 44 days. The total increasing trend of frost occurrence over the decades in the area will force to make strategy on contingent plan for major crops and adoptive measures from frost protection as to harvest highest genetic potential yield. Probability % of maximum frost occurrence during the month of January showed the decreasing trend of variation from 69% (1986-1995), 85% (1996-2005) and 63% (2005-2015) over the normal value of 72 %. Frost occurrence in the month of Dec- Jan will coincides with active tuber bulking phase in potato its effect is to bring about yield losses, and frost, foggy weather in winter months and occasional rains favours the late blight disease of potato in this region. So the decreasing tendency of frost days in January month in recent decades have beneficial impact on the growth of rabi crops in the region.

Keywords: Extreme, dry spell, wet spell, heat wave, cold wave, contingent plan, frost, tendency

Introduction
India being mainly an agricultural country, the economy and further its growth purely depends on the vagaries of the weather and in particular weather events. The weather and its variability are well known to the farming community. Possible impact of climate change on frequency and severity of weather extremes. They also referred that weather extremes can have a significant impact on agriculture and food security but their effect is often unclear, this may be due to interaction with other factors that affects yield and due to lack of precise definitions of relevant weather extreme. Extreme weather, in the most obvious sense, is weather that lies outside a locale's normal range of weather intensity. It is therefore by definition, infrequent or rare. Failures of rains and occurrence of natural disasters such as floods and droughts could lead to crop failures, food security, famine, loss of property and life, mass migration and negative national economic growth. Both the extremes of maximum and minimum temperatures cause stress to plant productivity (Ramakrishna, 2013) [2]. Extreme weather events like drought, flood, heat wave, cold wave, fog, thunder storm, dust storm, and hail storm causes considerable loss in crop productivity in the EPZ region. Use of improved climate and weather information and forecast along with efficient early warning systems contribute to the preparedness for extreme weather events to reduce loss of life and crop damage. For an instance, Providing forecasts and warnings of severe weather like extreme temperature, extreme cold, frost occurrence, and drought or flood in a timely manner contributes to preparedness. Better Agromet Advisories helps in minimizing the impact of extreme weather events in the region. Keeping above facts in view the present investigation was undertaken.

International Journal of Chemical Studies 2019, 7(1) 2018-2022

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 2018-2022
© 2019 IJCS
Received: 09-11-2018
Accepted: 13-12-2018

Sachin Kumar Shukla
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Arpita SN
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manoj Kumar
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Sachin Kumar Shukla
Department of Agricultural Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Validation of DSSAT model of rice cultivars under different growing environment of Eastern plain zone of U.P.

Sachin Kumar Shukla, AN Mishra, AK Singh, Arpita SN and Manoj Kumar

Abstract
A field experiment was conducted during Kharif 2016 to generate the ground truth data of rice crop at Agrometeorological Research Farm of N.D.U.A&T, of Kumarganj, Faizabad as to assess the "Validation of DSSAT model of rice cultivars under different growing environment of Eastern plain zone of U.P." The experiment was conducted in Randomized Block Design. The treatment comprised of three dates of Transplanting *viz.* 5th July (D_1); 15th July (D_2) and 25th July (D_3) with three varieties *viz.* NDR-80 (V_1); Pant Dhan-4 (V_2) and Swarna (V_3). The historical field crop data of year 2014 and 2015 were used for calibration and its validation was made from field crop data of year 2016.
Result reveals that crop growth simulation model was Model simulated the days taken to Panicle Initiation, Anthesis, Physiological Maturity, and Yield. And yield was closed in Accordance to Observed value and model overestimated the V_1 and V_2 Underestimated in 2016. And maturity was closed in Accordance to Observed value and model overestimated the V_3D_3 except D_1D_2 and V_1, V_2 Underestimated in 2016 and in Anthesis V_2, V_3 were overestimated and D_1V_1 were underestimated. Lowest error % was recorded in timely Transplanting crop of rice (5th July) with Swarna variety (D_2V_3) and error % increased with delay in Transplanting. DSSAT crop growth simulation model in rice crop depicted well the variation in yield due to varying crop growth environment. The simulated grain yield and phenological events were overestimated to observed values in timely transplanting suggested that the simulated yield were well within the accepted limits, therefore the model can be used for predicting rice yield and phenological events in eastern U.P.

Keywords: DSSAT, calibration, growing environment, anthesis and phenology

Introduction
Climate change and occurrence of extreme climate events are major concern for productivity of crop, and researchers are engaged in understanding its impact on various soil and crop processes, delineating vulnerable regions through growth and yield of crops and identifying suitable adaptation strategies to sustain systems productivity. Historic analysis of seasonal temperature indicates mixed trend of heating as well as cooling in various agro-climatic regions. There is a need to isolate the effect of other biophysical and socio-economic aspects, in order to work out the impact of climate change, which can be effectively done through use of mechanistic/dynamic simulation models.
The crop growth models are helpful to assess the impact of climate change on the stability of crop production under different management options. Crop growth simulation models provide means to quantify the effect of climate on soil, crop growth, productivity and sustainability of agriculture production. These tools can reduce the need for expensive and time consuming field experimentation and can be used to analyze yield gaps in various crops including wheat. Crop simulation model is quite useful as it forms a bridge between crop process analysis and performance assessment in which process operation are in their natural context.
The Decision Support System for Agro-technology Transfer (DSSAT) was originally developed by an International network of scientists. It is decision support system that encompasses process based computer models that predict growth development and yield as a function of a local weather soil condition, crop management scenarios and genetic information and also includes a basic set of tools to prepare the input data, as well as application programs for seasonal, crop rotation and spatial analysis. Hence the present investigation was undertaken.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1703-1705
© 2019 IJCS
Received: 28-05-2019
Accepted: 30-06-2019

Gajendra Singh
M.Sc. (Ag.) Thesis, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AN Mishra
Asstt. Prof., Deptt. of Agril. Meteorology, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Assoc. Prof., Deptt. of Agril. Meteorology, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SR Mishra
Assoc. Prof., Deptt. of Agril. Meteorology, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Rovit Kumar
M. Sc. (Ag.) Student, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manoj Kumar
Subject Matter Specialist Agrometeorolog, KVK, Chitrakoot, Uttar Pradesh, India

Correspondence
Gajendra Singh
M.Sc. (Ag.) Thesis, Department of Agricultural Meteorology, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of accumulated heat unit, heat use efficiency and solar radiation interception on mustard cultivars under different growing environment (*Brassica juncea* L.)

Gajendra Singh, AN Mishra, AK Singh, SR Mishra, Rovit Kumar and Manoj Kumar

Abstract
A field experiment was conducted during the *Rabi* season of 2018-19 to access the "Effect of different growing environment on growth and yield of mustard cultivars (*Brassica juncea* L.)" in silty loam soil at Agro-meteorological Research Farm of N.D. University of Agriculture & Technology, Kumarganj, Ayodhya. The experiment was conducted with RBD (Factorial) and replicated four times with nine treatment combinations consisted of three growing environment viz. 20th October, 30th October and 09th November and three cultivars *viz.* Varuna, Narendra rai-1 (NDR-8501) and Kranti. Results revealed that 20th October sown mustard crop produced significantly higher growth and yield due to fulfilment of optimum heat unit requirement, heat use efficiency and solar light interception for various processes of plant. Among the different cultivars of mustard, Varuna was recorded maximum heat unit (1660.6 °C days), heat use efficiency (0.50 g/m²/°days) and Solar radiation interception (589 MJ/m²) from sowing to maturity produced the high yield of Indian mustard.

Keywords: Heat unit, heat use efficiency, solar radiation interception, mustard, growing environment

Introduction
Mustard (*Brassica juncea* L.) belonging to family cruciferae is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeis guineensis jacq*). The important mustard growing countries of the world are India, Canada, China, Pakistan, Poland, Bangladesh and Swedan. India is one of the important country among the oilseeds producing countries of the world. Mustard is the second most important edible oil seed crop after groundnut in India. India occupies the second position in area after China and third position in production in the world after China and Canada. Indian mustard is also grown where annual precipitation of 500 to 1200 mm, temperature of 6 °C to 27 °C and soil pH of 6.5 to 8.3. Mustard is the crop of tropical as well as temperate zone. The temperature requirement varies from 0.5-3.0 °C ($T_{Min.}$) to 35-40 °C ($T_{Max.}$) with an optimum temperature regime of 20-35 °C. Cool temperature, dry weather with good amount of bright sunshine increases the oil yield. Mustard needs high temperature for vegetative growth (20-32 °C) and cool temperature. If the mustard is sown late, duration is reduced due to the high temperature during the reproductive phase with concomitant reduction in yield (Kumari *et al.*, 2004) [6]. The growth phase of the crop should synchronize with optimum environmental conditions for better expression of growth and yield. It is a fact that specified genotypes does not exhibit the same phenotypic characteristics in all environmental conditions. Bora (1997) [1] has reported that the yield potential of different mustard varieties may differ under different agro-climatic conditions because of their inherent capacity.

Materials and methods
An experiment was conducted at Agro-meteorological Research Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during Rabi season 2018-19. The farm is located 42 km away from Ayodhya city on Ayodhya - Raibareily road at 26°47' N latitude and 82°12' E longitude and at an attitude of about 113 meter above the mean sea level. The experiment was conducted in R.B.D. (Factorial).

International Journal of Chemical Studies 2019; 7(4): 2106-2109

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 2106-2109
© 2019 IJCS
Received: 28-05-2019
Accepted: 30-06-2019

Gajendra Singh
M Sc, Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AN Mishra
Asstt. Prof Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Assoc. Prof, Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SR Mishra
M Sc Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Rovit Kumar
Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manoj Kumar
Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Gajendra Singh
M Sc, Department of Agricultural Meteorology, ND. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of different growing environment on growth and yield of mustard cultivars (*Brassica juncea* L.)

Gajendra Singh, AN Mishra, AK Singh, SR Mishra, Rovit Kumar and Manoj Kumar

Abstract
A field experiment was conducted during the *Rabi* season of 2018-19 to access the "Effect of different growing environment on growth and yield of mustard cultivars (*Brassica juncea* L.)" in silty loam soil at Agro-meteorological Research Farm of N.D. University of Agriculture & Technology, Kumarganj, Ayodhya. The experiment was conducted with RBD (Factorial) and replicated four times with nine treatment combinations consisted of three growing environment viz. 20th October, 30th October and 09th November and three cultivars *viz.* Varuna, Narendra rai-1 (NDR-8501) and Kranti. Results revealed that 20th October sown mustard crop produced significantly higher growth and yield due to fulfilment of optimum heat unit requirement and solar light interception for various processes of plant. Among the different cultivars of mustard, Varuna was more conducive for growth, development, grain yield and heat use efficiency as compared to Narendra rai-1 (NDR-8501) and Kranti. Higher seed yield (18.90 q/ha) was recorded under 20th October sowing as compared to 30th October sown mustard crop and 09th November. Among the different cultivars, maximum yield of Varuna was 18.90 q/ha and performed 10.20% and 26.58% higher yield than Narendra rai-1 (NDR-8501) and Kranti respectively.

Keywords: Growth parameter, yield attributes, yield, mustard, growing environment

Introduction
Mustard (*Brassica juncea* L.) belonging to family cruciferae is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeis guineensis jacq*).). The important mustard growing countries of the world are India, Canada, China, Pakistan, Poland, Bangladesh and Swedan. Mustard is a Latin term 'must'/'mustum' denotes expressed juice of grapes and 'ardens' means hot and burning (Ahlawat, 2008)[1]. India is one of the important country among the oilseeds producing countries of the world. Mustard is the second most important edible oil seed crop after groundnut in India. India occupies the second position in area after China and third position in production in the world after China and Canada. Indian mustard is also grown where annual precipitation of 500 to 1200 mm, temperature of 6°C to 27°C and soil pH of 6.5 to 8.3. Mustard requires well drained sandy loam soil and low water (240 - 400 mm) which fits well in the rain fed cropping system. Development of high yielding varieties of mustard has been one of the major

Materials and methods
An experiment was conducted at Agro-meteorological Research Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, and Ayodhya (U.P.) during Rabi season 2018-19. The farm is located 42 km away from Ayodhya city on Ayodhya - Raibareily road at 26°47′ N latitude and 82°12′ E longitude and at an attitude of about 113 meter above the mean sea level. The experiment was conducted in R.B.D. (Factorial). Nine treatments combination comprised of three growing environment *viz.* crop sown on 20th October, crop sown on 30th October and crop sown on 9th November along with three cultivars *i.e.* Varuna, Nrendra-Rai-1(NDR-8501) and Kranti. The crop was fertilized with a uniform dose of nitrogen, phosphorus and potassium at 120:60:50 kg/ha, respectively. Urea, DAP and MOP were used as the source of nitrogen, phosphorus and potassium. Half dose of nitrogen along with full dose of phosphorus, potassium and sulphur were applied as basal dressing and remaining dose of nitrogen was top dressed into two equal splits. 1st split was top dressed at 30 DAS and 2nd splits dose at pre flowering stage of the crop.

International Journal of Chemical Studies 2019; 7(4): 1851-1853

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(4): 1851-1853
© 2019 IJCS
Received: 10-05-2019
Accepted: 12-06-2019

Pankaj Jaiswal
M.Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AN Mishra
Asstt. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AK Singh
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

SR Mishra
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Gajendra Singh
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Rovit Kumar
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Manoj Kumar
Matter Specialist Agrometeorolog, KVK, Chitrakoot, Uttar Parades, India

Correspondence
Pankaj Jaiswal
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Studies on crop growing environment of mustard (*Brassica juncea* L.) varieties of eastern plain zone

Pankaj Jaiswal, AN Mishra, AK Singh, SR Mishra, Gajendra Singh, Rovit Kumar and Manoj Kumar

Abstract
A field experiment was conducted during rabi season of 2018-19 entitled "Studies on crop growing environment of mustard (*Brassica juncea* L.) varieties of Eastern Plain Zone" at Agromet Research Farm of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The experiment was conducted in spilt plot design which consisted of nine treatment combinations comprised of three crop growing environments viz. Oct. 20th, Oct. 30th and Nov. 9th and three varieties viz. Varuna, NDR-8501 and Kranti. Results reveal that higher dry matter accumulation was recorded in crop growing environment Oct. 20th which was at par with crop growing environment Oct. 30th while significant over crop growing environment Nov. 9th. Among the varieties, higher dry matter accumulation was recorded in Varuna variety which was at par with NDR-8501 while significant over Kranti variety recorded lowest dry matter accumulation at all the growth stages.
Maximum thermal sensitivity Index from sowing to maturity was recorded in Varuna variety while minimum thermal sensitivity index was obtained in Kranti variety from sowing to maturity of Indian mustard. Higher GDD was recorded in crop growing environment Oct. 20th followed by crop growing environment Oct. 30th and crop growing environment Nov. 9th. Among the varieties, higher GDD was recorded under Varuna followed by NDR-8501 at all the stages of Indian mustard.

Keywords: Dry matter accumulation, thermal sensitivity index, GDD, Growing environment, mustard

Introduction
Indian mustard belongs to cruciferae family. Rapeseed is locally called sarson, toria, yellow toria, whereas, mustard is called rai or laha. Among the oilseeds *Brassica*, is the most important member of groups because more than 80 per cent of the area under rapeseed-mustard is followed by *toria, yellow sarson, gobhisarson, brown sarson and taramira.* Oilseeds, the second largest agricultural commodity after cereals in India, plays a significant role in India's agrarian economy, as more than 85 per cent of country's vegetable oil supply depend upon seven edible oilseeds (groundnut, rapeseed-mustard, soybean, sesame, sunflower, Niger and safflower) and two non-edible oilseeds (linseed and castor). Among the seven edible oilseed cultivation in India, rapeseed-mustard (*Brassica* spp.) contributes 28.6% in the production of oilseeds. Rapeseed-mustard is the major *rabi* oilseed crop of the country. India occupies the third position in rapeseed and mustard production in world after Canada and China. In India during year 2017-18, the area of Rapeseed-mustard was 6.4 million ha. with the production of 6.4 million tonnes and productivity of 987 kg/ha. In India, it is mainly cultivated in Rajasthan, Gujrat, Maharashtra, Haryana, Uttar Pradesh, Madhya Pradesh, Bihar, Assam, and West Bengal in varied situation. (Anonymous, 2017-18). Neoget *et al.*, (2005) revealed that as growing degree days (GDD) increased from 1270 to 1684 °C day in Pusa Jaikisan and Varuna, the seed yield -also increased and with the further increase in GDD accumulation, there was a decline in the seed yield of mustard. Change in sowing dates led to change in thermal environments of the cultivars with respect to different growth and development stages leading to variation in completion of life cycle (Roy *et al.*, 2005) [4]

Materials and Methods
The experiment was conducted at Agromet Research Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya- (U.P.) during Rabi season 2018-19, respectively. The farm is located 40 km away from Ayodhya city on Ayodhya- Raibareily road

International Journal of Chemical Studies 2019; 7(4): 1929-1931

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1929-1931
© 2019 IJCS
Received: 28-05-2019
Accepted: 30-06-2019

Rovit Kumar
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AK Singh
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AN Mishra
Asstt. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

SR Mishra
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Gajendra Singh
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Manoj Kumar
Matter Specialist Agrometeorolog, KVK, Chitrakoot, Uttar Parades, India

Correspondence
Rovit Kumar
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Phenophasic study of rice varieties under different crop growing environment

Rovit Kumar, AK Singh, AN Mishra, SR Mishra, Gajendra Singh and Manoj Kumar

Abstract
A field experiment was conducted during kharif season of 2018 entitled "Phenophasic study of rice varieties under different crop growing environment" at N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The experiment consisted of nine treatment combinations which comprised of three crop growing environment *viz.* July 15th, July 25th and August 04th and three varieties viz., NDR-97, NDR-2064 and BPT-5204. Results reveal that higher days taken to all phenophases from tillering to physiological maturity were recorded in crop growing environment of July 15th followed by July 25th. Among the varieties, BPT-5204 recorded higher days taken to physiological maturity followed by NDR-2064. Variety NDR-2064 followed by BPT-5204 were found suitable for higher growth, yield attributes and yield of rice. Crop growing environment of 15th July and variety NDR-2064 possess congenial weather and harvested maximum growth, yield attributes and yield of rice.

Keywords: Phenophasic duration, yield attributes, yield, growing environment, rice

Introduction

Rice is one of the most important cereal crop belong to the family *Poaceae.* It is the staple food for half of the world's population Temperature regimes greatly influenced not only the growth duration, but also the growth pattern and the productivity of rice crops. Extreme temperatures whether low or high cause injury to the rice plant. In tropical regions, high temperatures are a constraint to rice production. The most damaging effect is on grain sterility, just 1 or 2 hours of high temperature at anthesis (about 9 days before heading and at heading) result in a large percentage of grain sterility. Studies on rice productivity under global warming also suggest that the productivity of rice and other tropical crops will decrease as global temperature increases. Mohandrass *et al.* (1995) [3]. Such warming will thus reduce rice growth. In addition, higher temperatures will cause spikelet sterility owing to heat injury during panicle emergence. In temperate regions, increased air temperatures should hasten rice development, there by shortening the time from transplanting (or direct seeding) to harvesting and reducing the total time for photosynthesis yield development (Nguyen, 1994) [4]. Rice is very sensitive to higher temperature during reproductive stage especially flowering and anthesis. The elevated temperature at the time of flowering and maturity determines the yield per seed of the genotypes. Under high temperature stress, the response of genotypes depended on developmental stage, but highest sensitivity was recorded at reproductive stage. The time of sowing, days to flowering (duration group), heat escape (early morning flowering) and inbuilt tolerance were the crucial factors in determining the performance of genotypes to varying temperature. Hence, it is necessary to select genotypes by keeping in view the above factors for different temperature stress within and across the environment (Raju *et al.* 2013) [5]. Hence, present investigation was under taken.

Materials and Methods

A field experiments was conducted at N. D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during *kharif* season of 2018 which lies at latitude 26° 47'North longitude 82° 12' East and altitude of 113 meter from mean sea level in the Indo-genetic alluvium of Eastern Uttar Pradesh. The experiment was carried out in Randomized Block Design (Factorial), and replicated four times. The experiment comprised of three crop growing environment i.e. 15th July, 25th July and 04th August with three varieties i.e. NDR-97, NDR-2064 and BPT-5204. Fertilizers were applied @120:60:60 N: P_2O_5: K_2O kg/ha 1/3rd of

International Journal of Chemical Studies 2019; 7(4): 1956-1958

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(4): 1956-1958
© 2019 IJCS
Received: 01-05-2019
Accepted: 03-06-2019

Rovit Kumar
M.Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya Utter Pradesh, India

AK Singh
Assoc. Prof. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya Utter Pradesh, India

AN Mishra
Asstt. Prof. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya Utter Pradesh, India

Gajendra Singh
M. Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya Utter Pradesh, India

Manoj Kumar
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Correspondence
Rovit Kumar
M.Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya Utter Pradesh, India

Studies on accumulated thermal unit and thermal use efficiency at different phenophases of rice varieties under different crop growing environment

Rovit Kumar, AK Singh, AN Mishra, Gajendra Singh and Manoj Kumar

Abstract
A field experiment was conducted during kharif season of 2018 entitled "Studies on accumulated thermal unit and thermal use efficiency at different phenophases of rice varieties under different crop growing environment" at N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The experiment consisted of nine treatment combinations viz. three crop growing environment *viz.* July 15th, July 25th and August 04th and three varieties viz., NDR-97, NDR-2064 and BPT-5204. Results reveal that maximum accumulated thermal unit (2203.1°C days) was recorded in crop growing environment of July 15th followed by the July 25th (2089.8°C days). Among the varieties, maximum accumulated thermal unit in variety BPT-5204 (2367.2°C days) followed by NDR-2064 (2113.7°C days). Maximum thermal use efficiency of (0.51g/m²/°C days) was recorded in July 15th at Physiological Maturity followed by July 25th (0.475g/m²/°C days). NDR-2064 possess maximum TUE of 0.535g/m²/°C days at Physiological Maturity followed by BPT-5204 (0.505g/m²/°C days).

Keywords: Thermal unit, thermal use efficiency, growing environment, rice

Introduction
Rice is one of the most important cereal crop belong to the family *Poaceae*. It is the staple food for half of the world's population. Among the crop production tools, proper time of transplanting is the prerequisites that allow the crop to complete its life phase timely and successfully under a specific agro-ecology. In rice, the optimum leaf areas for seedlings, optimum leaf shapes to maximize photosynthetic efficiency, deep, well developed root systems, leaf area index (LAI) at flowering and crop growth rate (CGR) during panicle initiation have been identified as the major determinants of yield. Growth and grain yield reductions have been widely observed when traditionally flooded rice fields were subjected to water saving irrigation measures, where a continuous flood water layer is avoided.

Rice is very much sensitive to photo thermal regimes and the crop growth is influenced largely by the growing environmental conditions. Among them temperature plays a significant role in physiological, chemical and biological processes of plants. It is an important environmental factor influencing the growth and development of crops. During growth and development of a cereal, several growth stages are distinguishable in which important physiological processes occur. Influence of temperature on phenology and yield of crop plants can be studied under field condition through accumulated heat units. Plants have a definite temperature requirement for attainment of certain phenological stages. The duration of each phenophase determines the accumulation and partitioning of dry matter in different parts as well as crop responses to environmental and external factors. The occurrence of different phenological events during crop growth period in relation to temperature can be estimated by using accumulated heat units or growing degree days (GDD).

Growing degree days are based on the concept that the real time to attain a phenological stage is linearly related to temperature in the range between mean temperature and base temperature. A degree day or heat unit is the departure from the mean daily temperature above the minimum threshold temperature. The heat unit concept assumes that a direct and linear relationship between growth and temperature is advantageous for the assessment of yield potential of a crop in different weather conditions. Keeping above facts in view present investigation was under taken.

International Journal of Chemical Studies 2019; 7(4): 1959-1963

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1959-1963
© 2019 IJCS
Received: 04-05-2019
Accepted: 06-06-2019

Pankaj Jaiswal
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

AN Mishra
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

AK Singh
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

SR Mishra
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Rovit Kumar
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Gajendra Singh
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Kapil Dev Sharma
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Correspondence
Pankaj Jaiswal
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Studies on mustard (*Brassica juncea* L.) varieties under various crop growing environment in eastern plain zone

Pankaj Jaiswal, AN Mishra, AK Singh, SR Mishra, Rovit Kumar, Gajendra Singh and Kapil Dev Sharma

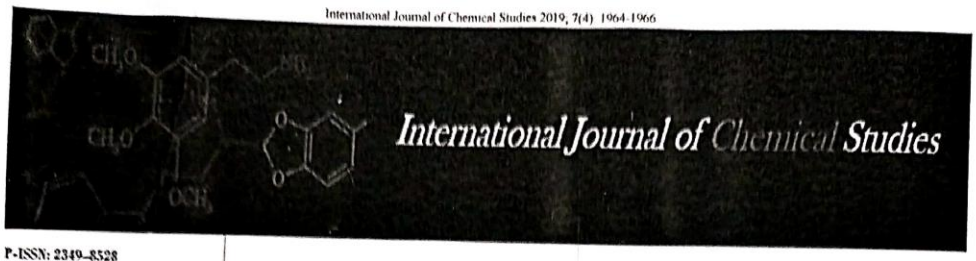
Abstract
A field experiment was conducted during rabi season of 2018-19 entitled "Studies on mustard (*Brassica juncea* L.) varieties under various crop growing environment in Eastern Plain Zone" at Agromet Research Farm of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The experiment was conducted in spilt plot design which consisted of nine treatment combinations comprised of three crop growing environments viz. Oct. 20th, Oct. 30th and Nov. 9th and three varieties viz. Varuna, NDR-8501 and Kranti. Results reveal thattaller plants (146.6 cm) were recorded in growing environment20th October. Shorter plants (116.8 cm) were recorded under 09th November. Among the varieties, taller plant height (143.8 cm) was recorded in Varuna. Significantly higher leaf area index at 60 DAS (4.67) was recorded in 20th October. Among the varieties, highest leaf area index (4.3) was recorded in Varuna variety. The maximum number of primary branches plant^{-1} was recorded on 20th October at 30, 60, 90 days and at harvest after sowing. Among the varieties, maximum number of primary branches plant^{-1} was recorded in Varuna variety. Significantly higher number of secondary branches plant^{-1} was recorded 20th October at 30, 60, 90 DAS and at harvest. Among the varieties, maximum number of secondary branches plant^{-1} was recorded with Varuna at 30, 60, 90 DAS and at harvest. The higher number of siliquae/plant, length of siliqua, Number of seeds/siliqua were recorded on 20th October date of sowing. Among the varieties, maximum numbers of siliquae/plant, length of siliqua, number of seeds/siliqua were recorded in Varuna variety of mustard. Maximum Seed yield (20.9 q/ha), Stover yield (74.3 q/ha), Biological yield (95.28 q/ha) were recorded on 20th October crop growing environment. Among the varieties, maximum Seed yield (20.2 q/ha), Stover yield (70.3 q/ha), Biological yield (90.6 q/ha) were recorded with Varuna.

Keywords: Leaf area index, plant height, yield attributes, growing environment, mustard

Introduction

Indian mustard belongs to cruciferae family. Rapeseed is locally called sarson, toria, yellow toria, whereas, mustard is called rai or laha. Among the oilseeds *Brassica*, is the most important member of groups because more than 80 per cent of the area under rapeseed-mustard is followed by *toria, yellow sarson, gobhisarson, brown sarson and taramira.* Oilseeds, the second largest agricultural commodity after cereals in India, plays a significant role in India's agrarian economy, as more than 85 per cent of country's vegetable oil supply depend upon seven edible oilseeds (groundnut, rapeseed-mustard, soybean, sesame, sunflower, Niger and safflower) and two non-edible oilseeds (linseed and castor).Among the seven edible oilseed cultivation in India, rapeseed-mustard (Brassica spp.) contributes 28.6% in the production of oilseeds.. Rapeseed-mustard is the major *rabi* oilseed crop of the country. India occupies the third position in rapeseed and mustard production in world after Canada -and China. In India during year 2017-18, the area of Rapeseed-mustard was 6.4 million ha. with the production of 6.4 million tonnes and productivity of 987 kg/ha. In India, it is mainly cultivated in Rajasthan, Gujrat, Maharashtra, Haryana, Uttar Pradesh, Madhya Pradesh, Bihar, Assam, and West Bengal in varied situation. (Anonymous, 2017-18). Neoget *et al.*, (2005) revealed that as growing degree days (GDD) increased from 1270 to 1684 °C day in Pusa Jaikisan and Varuna, the seed yield also increased andwith the further increase in GD Daccumulation, there was a decline in the seedyield of mustard. Change in sowing dates led to change in thermal environments of the cultivars with respect to different growth and development stages leading to variation in completion of life cycle (Roy *et al.*, 2005) [6]

International Journal of Chemical Studies 2019; 7(4): 1964-1966



P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1964-1966
© 2019 IJCS
Received: 07-05-2019
Accepted: 09-06-2019

Kapil Dev Sharma
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

SR Mishra
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

AN Mishra
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

AK Singh
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Gajendra Singh
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Rovit Kumar
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Vishesh Kumar
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Correspondence
Kapil Dev Sharma
Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Utter Pradesh, India

Studies on accumulated thermal unit of rice (*Oryza sativa* L.) cultivars under varying crop growing environment

Kapil Dev Sharma, SR Mishra, AN Mishra, AK Singh, Gajendra Singh, Rovit Kumar and Vishesh Kumar

Abstract
A field experiment was conducted during *kharif season* 2018 entitled "Studies on accumulated thermal unit of rice (*Oryza sativa* L.) cultivarsunder varying crop growing environment." in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The experiment consisted of nine treatment combinations comprised of three transplanting dates *viz.* July 15th, July 25th and August 04th and three varieties viz., NDR-97, NDR-2064 and BPT-5204. Results reveal that different phenophases of rice markedly varied with only dates of transplanting but also different weather variables which ultimately create the different crop growing environment to harvest the yield accordingly. Accumulated thermal unit was recorded in crop growing environment on July 15th (2158.5 ^{0}C days) at all the phenophases followed by July 25th (2059.7 ^{0}C days) and August 04th (1934.5 ^{0}C days) transplanting while among the cultivars BPT-5204 (2223.5 ^{0}C days) was recorded maximum thermal unit due to occurrence of long duration variety.

Keywords: Thermal unit, growing environment, growing degree days (GDD), rice

Introduction
Rice (*Oryza sativa* L.) being the staple cereal food crop, grown in India, providing one third of calories requirement for more than 70% of Indian population. More than 90% of world's rice is grown and consumed in Asia, known as rice bowl of the world. To focus attention on the importance of rice in global food security and necessity rice production and productivity, United Nation General Assembly in 2002, first time declared to celebrate the year 2004 as International year of rice with the name of "Rice is Life". Theheat unit concept assumes that a direct and linear relationship between growth and temperature is advantageous for the assessment of yield potential of a crop in different weather conditions. Reaumur was the first to suggest that duration of particular stages of growth is directly related to temperature summation. Knowledge of accumulated GDD can provide an estimate of harvest date as well as crop development stage. However, the impact of temperature, bright sunshine hour as well as day length on the growth habits of this crop are not well documented. The present experiment has been undertaken to address this lacunae (Malo *et al.*, 2018) [7]. The extreme climatic conditions, particularly high temperature, reduce the plant growth and yield significantly (Satake and Yoshida, 1978) [8]. The crop growth response is mainly influenced by the microclimate of crop canopy. Microclimatic environment in the crop refers to the interception of photo synthetically active radiation, prevailing wind speed, soil moisture availability, relative humidity and concentration of CO2.
Temperature and light radiation are key factors affecting crop production. During crop growth period, the occurrence of various phenological events can be estimated by computing accumulated growing degree days (Gouri *et. al.*, 2005) [4]. Accumulated growing degree days (GDD) provides an estimate of harvest date as well as development stages of crop (Ketring and Wheless, 1989) [6]. Various developmental stages as well as harvest date of crop can be estimated from the knowledge of accumulated GDD. Thermal time can be used as a tool for characterizing thermal responses in different crops as it is an independent variable to describe plant development (Dwyer and Stewart, 1986) [2]. Hence, the study was taken up to find out the thermal heat units requirement for different rice varieties, viz. NDR-97, NDR-2064 and BPT-5204.

International Journal of Chemical Studies 2019; 7(4): 1967-1969

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1967-1969
© 2019 IJCS
Received: 10-05-2019
Accepted: 12-06-2019

Kapil Dev Sharma
M. Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

SR Mishra
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AK Singh
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

AN Mishra
Asstt. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Gajendra Singh
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Vineet Kumar
Matter Specialist Agrometeorolog, KVK, Chitrakoot, Uttar Parades, India

Pankaj Jaiswal
M.Sc Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Correspondence
Kapil Dev Sharma
M. Sc, Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Parades, India

Studies on thermal use efficiency, heliothermal unit and photothermal unit of rice (*Oryza sativa* L.) cultivars under varying crop growing environment

Kapil Dev Sharma, SR Mishra, AK Singh, AN Mishra, Gajendra Singh, Vineet Kumar and Pankaj Jaiswal

Abstract
A field experiment was conducted during *kharif* season2018 entitled "Studies on thermal use efficiency, heliothermal and photothermal unitof rice (*Oryza sativa* L.) cultivarsunder varying crop growing environment." in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The experiment consisted of nine treatment combinations comprised of three transplanting dates *viz*. July 15th, July 25th and August 04th and three varieties viz., NDR-97, NDR-2064 and BPT-5204. Results reveal that different phenophases of rice markedly varied with only dates of transplanting but also different weather variables which ultimately create the different crop growing environment to harvest the yield accordingly. Highest thermal use efficiency (TUE) was recorded in crop growing environment on July 15that all the stage, followed by July 25th, among the cultivars highest thermal use efficiency was recorded with BPT-5204, followed by NDR-2064.Maximum heliothermal unit was recorded in crop growing environment on July 15th at both the stages vegetative and reproductive stage followed by July 25th. Maximum photothermal unit was recorded in crop growing environment on July 15th at both the stages, followed by July 25th at vegetative and reproductive stage and among the cultivars in BPT-5204.

Keywords: Thermal use efficiency, heliothermal unit, photothermal unit, rice

Introduction
Rice is the most consumed cereal grain in the world constituting the dietary staple food of more than half of the world population. Apart from food rice is intimately involved in the culture as well as economy of many societies. Rice a member of the family *Poaceae* originated from South East Asia and in Asia where more than 90 per cent of world's rice is produced and consumed with two countries, China and India, growing more than half of the total crop. Thus rice is immensely important to food security of Asia. Crops sown on different dates are exposed to different solar duration during the season and this may influence Radiation use efficiency through its effect on radiation transmission (Khichar *et al.*, 2000) [2]. The duration of growth stage of any particular species was directly related to temperature and it could be predicted using the sum of daily air temperature. Temperature is an important environmental factor that influences the growth and development, phenology and yield of crops (Bishnoi *et al.*, 1995) [1]. Heat use efficiency (HUE), i.e., efficiency of heat utilization in terms of dry matter accumulation, depends on genetic factors, crop type and sowing time and has great practical application (Rao *et al.*, 1999) [3]. The effects of meteorological factors on crop production and yield can be assessed in two different ways (Van Keulen 1987) [4].

Materials and Methods
The field experiments was conducted at N. D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during *kharif* season of 2018 situated at a distance of about 40 km. away from Ayodhya district headquarter on Ayodhya Raibarelly road. The geographical situation of experimental site lies at latitude 26° 47'North longitude 82° 12' East and altitude of 113 meter from mean sea level in the Indo-genetic alluvium of Eastern Uttar Pradesh. The experiment was carried out in Randomized Block Design (Factorial) and replicated four times. The experiment comprised of three crop growing environment i.e. 15th July, 25th July and 04th August with three varieties i.e. NDR-97, NDR-2064 and BPT-5204.

International Journal of Chemical Studies 2019; 7(4): 1983-1985

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 1983-1985
© 2019 IJCS
Received: 19-05-2019
Accepted: 21-06-2019

Vineet Kumar
M.Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SR Mishra
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AN Mishra
Asstt. Prof. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Assoc. Prof., Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

RB Singh
Asstt. Prof. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Vishesh Kumar
M. Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Kapil Dev Sharma
M. Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Vineet Kumar
M.Sc. Department of Agricultural Meteorology, N. D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Larval fluctuation of *Helicoverpa armigera* with reference to environmental factors in chickpea crop

Vineet Kumar, SR Mishra, AN Mishra, AK Singh, RB Singh, Vishesh Kumar and Kapil Dev Sharma

Abstract
A field experiment was conducted during rabi season of 2017-18 entitled "Larval fluctuation of *Helicoverpa armigera* with reference to environmental factors in chickpea crop." in sandy loam soil of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The experiment consisted of nine treatment combinations comprised three varieties and three date of sowing viz., sowing on Nov. 5th with temperature 23.8 °C, Nov 15th with temperature 20.8 °C and Nov. 25th with temperature 16.8 °C and three varieties Uday (V_1), Pusa-362 (V_2) and Radhey (V_3). Results reveal that the all three varieties under three date of sowing Peaks larval population of pod borer were recorded during 8th to 9th standard week. Highest larval population (5.50 larvae/plant) was recorded in crop sown at November 25th followed by November 15th sown crop while lowest in sown on November 05th, larval population increased with increase in temperature, maximum temperature from 25°C to 35°C increases the larval population, while minimum temperature from 10 °C to 14 °C indicate that larval population increased with increase in minimum temperature in all varieties.

Keywords: Chickpea, population dynamics, *Helicoverpa armigera*

Introduction
Chickpea, (*Cicer arietinum* L.) is one of the most important legume crop in the world and in the Asia region. Chickpea is the premier pulse crop of Indian sub continent. India is the largest chickpea producer as well as consumer in the world. Pulse occupies an unique position in Indian agriculture by virtue of its high protein content and its capacity to enrich the soil fertility through the mechanism of symbiotic nitrogen fixation. It is a super energy umbrella for the people as dietary protein for the livestock as green nutritious fodder and feed and for the soil as a mini nitrogen plant and green manure (Ali, 1988) [1]. Chickpea is a good source of protein (21.1%), Carbohydrates (61.5%), Minerals (Ca, P and Fe) and Vitamins (C). Among the various insects that attack chickpea crop, pod borer (*Helicoverpa armigera*) is the most damaging insect. It is quite prevalent in Asia, Africa, Australia and some other chickpea growing regions. As pod borer is a polyphagous insect that attacks on more than 182 plant species, the development of cultivars resistant or tolerant to *H. armigera* could be integrated in the pest management strategy particularly in the developing countries (Fitt 1989). Among different insect-pests of -chickpea in field gram pod borer *(H. armigera)* is serious pest which cause damage upto 20-50 % pod damage throughout the country (Anonymous, 1978), 16-18% at Almora in Uttaranchal, 16-22% in Orissa and it causes serious damage to the crop every year in Punjab (Atwal, 1991). The young larvae feed on the tender portion of leaves and shoots by scratch them. Grown up larvae consume leaf buds, whole leaf and flowers under severe infestation, the whole plant may get defoliated with the availability of pods, the third instars larvae make a hole in the pods and move inside to feed on grains, where as fully grown larvae feed after making a hole in the pods and thrusting its head, there in while keeping hind parts of the body outside. A single larva destroys about 30-40 % pods (Reed and Pawar, 1982) [5].

Materials and Methods
The experiment was conducted during Rabi season 2017-2018 at Student's Instructional Farm of N.D.U.A.&T., Kumarganj, Ayodhya (U.P.). Geographically, the experimental site is situated at 26°47 N latitude, 82°12 E longitude and at an attitude of 113 meters above mean sea

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(5): 3029-3031
© 2019 IJCS
Received: 21-07-2019
Accepted: 23-08-2019

Ajeet Kumar
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Associate Prof., Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Associate Prof., Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

Anil Nishad
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Ajeet Kumar
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

Effect of changing environment on growth and yield of chickpea (*Cicer arietinum* L.)

Ajeet Kumar, SR Mishra, AK Singh, RK Aryan and Anil Nishad

Abstract
A field experiment was conducted during *rabi season* of 2016 on the topic entitled "Study the crop-weather interaction on chickpea (*Cicer arietinum* L.) Cultivars" in sandy loam soil of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P). The experimental consisted of nine treatment combinations comprised of three growing environment *viz.*, sowing on Oct.25th with temperature 24.2 ^{0}C, Nov.4th with temperature 22.5 ^{0}C and Nov.14th with temperature 22.2 ^{0}C and three varieties viz. Radhey, Pusa-372, and BG-256. Results revealed that plant height Taller plants were obtained at sowing temperature 32.5 ^{0}C (exist on October 25th) which was significant higher over rest sowing dates. Shorter plants were recorded under sowing date November 14th. higher leaf area index was obtained at sowing temperature 32.5 ^{0}C (existed on Oct.25th) as compared to sowing done on Nov.4th and Nov.14th in which later sown i.e. Nov.14th proved lowest LAI at all the stages of crop. Higher leaf area index was obtained in Radhey followed by BG-256 while significantly superior over Pusa-372 cultivar at all the successive stages of chickpea. Maximum plant population (32plant m^{-2}) was recorded under sowing done on Oct.25th with sowing temp. 32.5 ^{0}C followed by Nov.4th sowing of chickpea. Delay in sowing recorded lowest no. of initial plant population of chickpea Radhey cultivar exhibited maximum initial plant population (32) followed by Pusa-372 (30). Number of branches plant^{-1} shows that different growing environment had significant influence on the number of branches plant^{-1} at all the stages. Crop sown on Oct.25th with temperature 32.5 ^{0}C produced significantly higher number of branches plant^{-1} was significantly superior over both sowing done on Nov.4th with temperature 30.5 ^{0}C and Nov.14th with temperature 31 ^{0}C. Number of branches plant^{-1} was affected significantly by varieties at all the stages.

Keywords: chickpea, plant height, LAI, number of branches/plant, initial plant population

Introduction
Chickpea (*Cicer arietinum* L.) is one of most important pulse crop of India. Chickpea probably originated in south-eastern Turkey and spread west and south via the silk route. Four centres of diversity have been identified in the Mediterranean, Central Asia, near East Asia and India, as well as a secondary centre of originated Ethiopia. It is the world third most important food legume and India is placed first in production. India is the largest producer of chickpea in the world covering 8.25 million hectare area and producing 7.33 million tonne of grain with an average productivity of 889 kg h^{-1} in year 2014-15 (Anonymous, 2016). In Uttar Pradesh, chickpea is cultivated on an area of 0.58 Million hectares in India 5.64% with an annual production of 0.48 Million tonne, in India 4.81% the average productivity of this crop in U.P is only 12.12q ha^{-1}. Yield 824 kg/hectare annual report (2014-15). Sowing date and temperature have been proved to be one of the most non-monetary inputs affecting the yield of chickpea. Sub optimal thermal regimes during crop growing season are known to have profound effect on crop productivity. The production potential of high productive varieties may be exploited by sowing them at their most optimum time. Chickpea cultivated with medium and long duration varieties is generally delayed. All the chickpea varieties are sensitive to photo and thermal-period. Delay in sowing causes early maturity of the cultivars resulting in drastic reduction of the yield. Optimum sowing time is considered for maximum advantages of environmental condition, especially in the terms of the thermal requirement by the crop canopy. The productivity of chickpea in eastern U.P. is quite below than the national average due to which suitable varieties will therefore, be quite helpful in increasing the yield (Shendge *et al.*, 2002) [4].

Materials and Methods
The present investigation entitled "Study the crop weather interaction on chickpea (*Cicer arietinum* L.)" was carried out during *Rabi* season of 2016-2017 at Student Instructional Farm

International Journal of Chemical Studies 2019; 7(5): 3032-3035

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(5): 3032-3035
© 2019 IJCS
Received: 23-07-2019
Accepted: 25-08-2019

Ajeet Kumar
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

SR Mishra
Associate Prof., Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Associate Prof., Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

RK Aryan
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

Anil Nishad
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, Inc

Corresponding Author:
Ajeet Kumar
Research Scholar, Department of Agricultural Meteorology, N.D.U.A.T Kumarganj, Faizabad, Uttar Pradesh, India

Phonological growth and development of chickpea (*Cicer arietinum* L.) cultivars at climatic condition

Ajeet Kumar, SR Mishra, AK Singh, RK Aryan and Anil Nishad

Abstract
A field experiment was conducted during *rabi season* of 2016 on the topic entitled "Study the crop-weather interaction on chickpea (*Cicer arietinum* L.) Cultivars" in sandy loam soil of N.D. University of Agriculture and Technology [illegible] Faizabad (U.P). The experimental consisted of nine treatment combinations comprised of three growing environment *viz.*, sowing on Oct.25th with temperature 24.2 ^{0}C, Nov.4th with temperature 22.5 ^{0}C and Nov.14th with temperature 22.2 ^{0}C and three varieties viz. Radhey, Pusa-372, and BG-256. Results revealed that Heat use efficiency (0.62 gm^{-2} ^{0}C day^{-1})and radiation use efficiency (1.6 g/MJ) was recorded when sowing was done sown Oct.25thwith temperature 24.2 ^{0}C followed by sowing done on Nov.4th while lowest heat use efficiency and radiation use efficiency was recorded when sowing was done on Nov.14th with sowing temperature 22.2 ^{0}C. Radhey cultivar was found more conducive and remunerative for growth development seed yield radiation use efficiency and heat use efficiency.

Keywords: Phenological stages, GDD, Dry matter accumulation, HUE, RUE

Introduction
Chickpea (*Cicer arietinum* L.) is one of most important pulse crop of India. Chickpea probably originated in south-eastern Turkey and spread west and south via the silk route. Four centres of diversity have been identified in the Mediterranean, Central Asia, near East Asia and India, as well as a secondary centre of originated Ethiopia. It is the world third most important food legume and India is placed first in production. Chickpea cultivated with medium and long duration varieties is generally delayed. All the chickpea varieties are sensitive to photo and thermal-period. Delay in sowing causes early maturity of the cultivars resulting in drastic reduction of the yield. Optimum sowing time is considered for maximum advantages of environmental condition, especially in the terms of the thermal requirement by the crop canopy. The productivity of chickpea in eastern U.P. is quite below than the national average due to which suitable varieties will therefore, be quite helpful in increasing the yield (Shendge *et al.*, 2002) [9]. The most important factors affecting chickpea development are generally temperature, photoperiod, and moisture. Temperature (Singh & Dhaliwal 1972; Siddique & Sedgley 1986) [11, 10], moisture (Saxena 1990) [8], and depth of sowing (Saxena 1987) [7] mainly control the duration from sowing to emergence. After emergence, temperature, and photoperiod (Sandhu & Hodges 1971) [6] coupled with the availability of soil moisture (Khanna-Chopra & Sinha 1987; Piara Singh 1991) [1, 3] control the rate of progress towards any phenological stage. In chickpeas, flowering is considered the critical stage, because environmental conditions that prevail at flowering and the duration of the reproductive phase determine, to a large extent, the percentage of fruit set and the final yield (Savithri *et al.* 1980) [5]. Therefore, being able to predict the time of flowering may be more important than any of the other phenological stages. Considerable work has been done on the photothermal responses of chickpeas to predict time to flowering (Summerfield & Roberts 1988) [12]. As in most grain legumes, increased temperatures speed up the rate of development of all developmental stages of chickpeas (Summerfield *et al.* 1984; Roberts *et al.* 1985) [12, 4].

Materials and Methods
The experiment comprised three different types of Cheakpea varieties Radhey (V_1), Pusa-372 (V_2), and BG-256 (V_3) at three growing environment *viz.*, October. 25th growing environment 24.2 °C (D_1), Nov.4th growing environment 22.5 °C (D_2), Nov.14th growing environment 22.2 °C (D_3) during 2016. The experiment was conducted in Randomized Block Design (RBD) and replicated the three times. The different growth parameters studied were measured as follows;

International Journal of Chemical Studies 2019; 7(6): 1151-1153

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(6): 1151-1153
© 2019 IJCS
Received: 07-09-2019
Accepted: 09-10-2019

KKK Reddy
Ph.D. Scholar, Department of Agronomy, PJTSAU, Hyderabad, Rajendranagar, Telangana, India

AK Singh
Department of Agronomy, NDUAT, Kumarganj, Uttar Pradesh, India

RS Singh
Department of Agronomy, NDUAT, Kumarganj, Uttar Pradesh, India

Corresponding Author:
KKK Reddy
Ph.D. Scholar, Department of Agronomy, PJTSAU, Hyderabad, Rajendranagar, Telangana, India

Soil moisture depletion as influenced by planting geometry and moisture regimes in *rabi* maize (*Zea mays* L.)

KKK Reddy, AK Singh and RS Singh

Abstract
A field experiment was conducted during *rabi* season 2016-2017 at Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) to study soil moisture depletion as influenced by planting geometry and moisture regimes in *rabi* maize. The experiment was laid out in split plot design with three replications keeping combinations of planting geometry *viz.*, 60 × 10 cm, 60 × 15 cm, 60 × 20 cm, 60 × 25 cm and four moisture regimes *viz.*, 0.6 IW/CPE ratio, 0.9 IW/CPE ratio, 1.2 IW/CPE ratio, 0.9 IW/CPE ratio up to silking and 1.2 IW/CPE ratio for rest of the crop season. Among four planting geometries, highest soil moisture depletion (40.16 cm) was recorded in 60 × 10 cm. Among four moisture regimes, highest soil moisture depletion (45.91 cm) was recorded in 1.2 IW/CPE ratio. With respect to treatment combinations, higher soil moisture depletion (47.8 cm) was recorded in 60 × 10 cm and 1.2 IW/CPE ratio.

Keywords: Soil moisture depletion, *Rabi* maize, planting geometry, IW/CPE ratio, moisture regimes

Introduction
Maize (*Zea mays* L.) is the third most important grain crop in India after rice and wheat with respect to area and productivity. Globally maize is cultivated in an area of 177 million hectares with a production and productivity of 989 and 5.5 metric t ha^{-1}, respectively (Commodity profile-maize, 2015). In India it is grown in an area of 9.43 million hectares with production of 24.35 Mt and 2562 kg ha^{-1} productivity (CMIE, 2016). It has wide ecological adaptability and is grown in extreme semi-arid to sub-humid and humid regions as a staple crop for human beings, feed for animals and as a basic raw material for production of starch, oil, protein, alcoholic beverages, food sweeteners and more recently bio-fuel (Dass *et al.*, 2008) [3]. The average grain yield of maize is not only substantially lower compared with other important maize growing countries but also less than the production potential of existing genotypes. Traditionally maize is a rainy/*kharif* season crop in India and is extensively grown under rainfed conditions, but *kharif* crop suffers due to vagaries of monsoon, excessive rainfall leading to water stagnation, poor drainage, erratic and insufficient rainfall leading to moisture stress condition, severe infestation of pests and diseases, fertilizer losses, greater weed menace and high temperature throughout the growth period which tend to reduce grain yield. On the contrary, the risk of damage to the crop from excessive rainfall, water stagnation, inadequate soil moisture, pest and disease infestation during winter/*rabi* season is less. The average grain yield of maize is not only substantially lower compared with other important maize growing countries but also less than the production potential of existing genotypes. Low yield of maize is due to many constraints but among them, cultivation of local genotypes, imbalanced use of fertilizers, traditional sowing methods, improper water management, lack of optimal crop stand and optimum planting geometry are the factors of prime importance. Planting geometry and water management play an important role in enhancing the crop productivity. Planting geometry *i.e.* plant population per unit area have immense role since it is a non tillering crop. Sub optimal plant stand *i.e.* wider spacing leads to poor yield per unit area. While higher plant populations have greater competition for growth resources and leads to poor yield. In order to produce higher yields of maize, optimum soil moisture should be maintained as it is susceptible to both water logging and water deficit. Among the different approaches for scheduling, the climatological approach based on IW/CPE ratio (IW - irrigation water, CPE - cumulative pan evaporation) has been found most appropriate as it integrates all weather

International Journal of Chemical Studies 2019, 7(1): 268-270

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 268-270
© 2019 IJCS
Received: 19-11-2018
Accepted: 23-12-2018

Shashank Shekher Singh
Department of Agronomy, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Anil Kumar Singh
Department of Agronomy, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Permendra Singh
Department of Agronomy, Advanced Center for Rain fed Agriculture, S.K.U.A.S.T. Jammu, Jammu and Kashmir, India

Correspondence
Permendra Singh
Department of Agronomy, Advanced Center for Rain fed Agriculture, S.K.U.A.S.T. Jammu, Jammu and Kashmir, India

Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) varieties under Indo-gangetic plains of Awadh area

Shashank Shekher Singh, Anil Kumar Singh and Permendra Singh

Abstract
The field experiment entitled "Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) varieties" was conducted at Agronomy Research Farm of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh during *Kharif* season of 2015 with an objective to find out suitable date of transplanting of rice, the treatment consisted of three transplanting date (15 July, 25 July and 5 August) and three varieties (Sarju-52, NDR-359 and Swarna) there were 9 treatment combinations.

The values of growth contributing characters viz. plant height (cm), number of tillers, dry matter accumulation, leaf area index and yield attributes like number of panicles m^{-2}, length of panicle (cm), number of $panicle^{-1}$, grain weight $panicle^{-1}$, grain and straw yield (q ha^{-1}) were increasing significantly with 15 July date of transplanting followed by 25 July date of transplanting and significantly superior with 5 August date of transplanting. In case of variety the performance the growth characters like plant height (cm), number of $tillersm^{-2}$, dry matter accumulation (g m^2) leaf area index and yield attributes like number of panicles m^{-2}, length of panicle (cm), number of $panicle^{-1}$, grain weight $panicle^{-1}$, grain and straw yield (q ha^{-1}). Swarna recorded higher yield and yield attribute which was at par with NDR-359 and significant over Sarju-52.

Keywords: transplanting, *Oryza sativa*, indo-gangetic, awadh area

Introduction

Rice (*Oryza sativa* L.) is one of the most important cereal crops of *kharif* season. Rice is cultivated world-wide over an area of about 160.68 million ha^{-1} with an annual production of about 650.19 million tonnes. In India it is cultivated over an area of about 39.16 million hectares with an annual production of about 85.59 million tonnes and the productivity of 2.20 tonnes ha^{-1}. Uttar Pradesh is an important rice growing state in the country. The area and production of rice in U.P. is about 13.84 million hectare and 14.00 million tonnes respectively with an average production of 2.35 tonnes (Anonymous, 2013) [1-4]. Production of rice rank second among the food grain and half of the world population receiving the highest (26.2%) calories intake from it in the developing countries of their dietary protein (FAO, 2009) [6]. Rice is an excellent source of carbohydrate and to a certain extent it provides protein to regular human diet. So it is used as staple food crop by about half of the world population and eaten as cooked rice and also used for various preparations inhabiting in the humid tropics and subtropics. Further, rice has commercial and industrial importance also beside grains. Rice straw and rice hulls are used as fodder, mulching, packing and as insulation material etc.

Globally rice is grown on 153 mha (FAO, 2006) [5]. Though its production and consumption is concentrated in Asia, where more than 90% of rice is consumed. India produced 103.41 million tones during 2011-12 from 44.07 million hectares with average productivity of 2270.75 kg/ha. Dry matter accumulation in leaves decreased in test cultivars (PR-106, PR-109 and Basmati-370) with later transplanting dates. Delayed transplanting reduced seedling dry matter in PR-106 and PR-109, but an increase was observed in Basmati-370 with least accumulation of dry matter in leaves.

Different varieties respond variably under different date of transplanting. In view of above facts, the present investigation entitled, "Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) Varieties" was conducted during kharif 2015 with the

Annexure-14

Vol. 19, No. 1, pp. 76-90 (2019)
Journal of Agricultural Physics
ISSN 0973-032X
http://www.agrophysics.in

Research Article

Impact of Seasonal Change in Temperature and Sowing Date on Wheat Productivity in India: A Modelling Study

S.S. SANDHU[1], PRABHJYOT-KAUR[1], S.R. PATEL[2], RAJINDER PRASAD[3], N.S. SOLANKI[4], PRAGYAN KUMARI[5], C.B. SINGH[6], A.P. DUBEY[6], SHABAD ADHAR[7], A.K. SINGH[7] AND V.U.M. RAO[8]

[1]*Department of Climate Change and Agricultural Meteorology, Punjab Agricultural University, Ludhiana, Punjab*
[2]*Department of Agronomy, Indra Gandhi Krishi Vishawvidayala, Raipur, Chhattisgarh*
[3]*Department of Agronomy, Himachal Pradesh Krishi Vishawvidyala, Palampur, Himachal Pradesh*
[4]*Department of Agronomy, Rajasthan College of Agriculture, Udaipur, Rajasthan*
[5]*Department of Agricultural Physics and Meteorology, Bisra Agricultural University, Ranchi, Jharkhand*
[6]*Department of Agronomy, C.S. Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh*
[7]*N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh*
[8]*Central Research Institute for Dryland Agriculture, Hyderabad, Andhra Pradesh*

ABSTRACT

Wheat is important for food security of India and temperature is one of the most important abiotic factors affecting its productivity. A simulation study was conducted to analyze the effect of seasonal temperature change from normal on wheat productivity in different regions of India and secondly to determine the optimum sowing period for adapting the wheat to changed growing season temperature conditions. The CERES-Wheat simulation model available in DSSAT v4.5.0.0 was used to simulate wheat productivity at seven locations spread across wheat growing area of India. The results showed that the seasonal increase (normal + 3.0°C) in temperature may result in reduction in productivity of wheat sown at any time, except in case of late sown wheat at Palampur (northern hill zone) and Ludhiana (north western plain zone). The decrease in temperature may result in a reduction in productivity of early, timely and late sown wheat at Palampur and at Kanpur. While at Ludhiana productivity of timely and late sown wheat and at Udaipur that of late sown wheat was reduced. At rest of the location the decrease in temperature had favourable affect on wheat productivity. The productivity of early sown wheat at Ranchi and Raipur and that of late sown wheat at rest of the locations was less affected by seasonal increase in temperature as compared to other times of sowing. The wheat productivity at Raipur (Central zone) was most susceptible to change in temperature as compared to rest of the zones.

Key words: Heat stress, Wheat, Seasonal, Temperature, DSSAT

Introduction

Wheat (*Triticum aestivum* L.) is very important for food security of India and it is the second largest wheat producer in the world and produced 94.88 million tonnes of total wheat from 29.90 million hectares of area during 2011-2012 (Anonymous, 2013).

Many abiotic and biotic factors limit the production of wheat. Amongst the abiotic factors,

*Corresponding author,
Email: ssandhu@pau.edu; sssandhuagron@gmail.com

Article-12

ISA/2020(3)/68

Indian Journal of Agronomy 65 (2): 67–69 (June 2020)

Research Paper

Effect of nitrogen levels on yield and yield attributes of rice (*Oryza sativa*) grown under different planting geometry

PRADEEP RAJPUT[1], A.K. SINGH[2], RAVINDRA KUMAR RAJPUT[3] AND ADESH SINGH[4]

Acharya Narendra deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh 224 229

Received : March 2020; Revised accepted : June 2020

ABSTRACT

A field experiment was conducted during the rainy season (*kharif*) 2017 at Kumarganj Ayodhya, Uttar Pradesh, to study the effects of nitrogen on rice (*Oryza sativa* L.) grown under different planting geometry. Four planting geometry, viz. 15 cm × 10 cm, 15 cm × 15 cm, 20 cm × 10 cm and 20 cm × 15 cm and 4 nitrogen levels (0, 60, 120 and 180 kg/ha) were tested in a split-plot design, keeping as main and subplots, respectively, with 3 replications. The crop received a total rainfall of 804.9 mm, while the evaporation was 126.1 mm during the entire crop season. The experimental result revealed that different planting geometry and level of nitrogen had a remarkable influence on almost all the yield-attributing characters and yield of rice. Different yield-attributing characters, viz. panicle length, panicles/m², grains/panicle and test weight, were increased significantly with the increasing level of nitrogen from 0 to 180 kg/ha. On the other hand, plant spacing 20 cm × 10 cm resulted in significantly higher grain yield (5.40 t/ha). The highest grain and straw yields were recorded with the treatment of 20 cm × 10 cm plant spacing and 180 kg N/ha.

Key words: Nitrogen, Planting geometry, Rice, Yield and yield components

Rice is a most important cereal crop of rainy (*kharif*) season, grown under semi-aquatic condition and mostly under submergence or variable ponding conditions (alternate wetting and drying/ 2–4 days after disappearance of ponded water). It is a most important staple food of about more than 60% of total world population. Rice is a nutritious cereal crop, mainly used for human consumption. It is the main source of energy and is an important source of protein, providing substantial amount of the recommended nutrients intake of zinc and niacin. Agronomic management practices such as spacing and nitrogen application are 2 major factors influencing the growth and yield of rice. Optimum dose of nitrogen fertilization plays a vital role in growth and development and grain formation as a result of higher yield of rice plant. Excessive nitrogen fertilization encourages excessive vegetative growth which makes the plant susceptible to insect, pest and diseases, which ultimately reduces yield, whereas less than optimum rate affects both yield and quality of rice to remarkable extent. So, it is essential to find out the optimum rate of nitrogen application for its efficient utilization by the plants for better yield. Since optimum plant spacing ensures plants to grow properly both in their aerial and underground parts through utilization of solar radiation and nutrients, proper manipulation of planting density may lead to enhance the economic yield of transplanted rice (Sampath *et al.*, 2017). Planting geometry determines the planting density or plant population in unit area, thereby influencing the input-use efficiency and yield of the crop. Plant spacing is a major non-monetary input which plays a significant role in achieving greater nutrient-use efficiency with higher growth and yield of the crop. Salahuddin *et al.* (2009) reported that, the lowest number of grains/panicle was produced under control (0 kg N/ha) irrespective of the plant spacing. Though grain yield/ha increased with increasing level of nitrogen up to 180 kg/ha, irrespective of plant spacing. Keeping above points in view, the present investigation was carried out to assess the effect of nitrogen in transplanted rice under varying plant spacing in a sandy-loam soil.

The experiment was conducted during the rainy (*kharif*) season of 2017 at the Narendra Deva University of Agriculture and Technology, Kumarganj (26.47° N, 82.12° E and 113 meters above mean sea-level), Ayodhya, Uttar

[1]Corresponding author's Email: pradeep16041996@gmail.com
[1]Ph.D. Scholar, [2]Assistant Professor (Agronomy); [3]Subject Matter Specialist, Department of Soil JScience and Agricultural Chemistry, Krishi Vigyan Kendra, Mathura, Uttar Pradesh 281 001; [4]Assistant Professor (Agronomy), Sardar Vallabhbhai Patel University of Agriculture and Technology, Modipuram, Meerut, Uttar Pradesh

The Pharma Innovation Journal 2020; 9(9): 343-346

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(9): 343-346
© 2020 TPI
www.thepharmajournal.com
Received: 05-07-2020
Accepted: 25-08-2020

Rakesh Kumar Kushwaha
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Pandey
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Arun Kumar
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Suraj Kumar
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
AN Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of El-Nino on rainfall and Production of major crops and strategies to enhance the productivity of Eastern Plain Zone of U.P.

Rakesh Kumar Kushwaha, AK Singh, AN Mishra, SR Mishra, Alok Kumar Pandey, Arun Kumar and Suraj Kumar

Abstract
District wise monthly rainfall data of Eastern Plain Zone of Uttar Pradesh recorded for the period of 1981 to 2017 were used under the present study. The total rainfall for the summer (March to May), South-West monsoon (June to September), Rabi (October - December) and winter (January - February) seasons were computed year wise for various districts of Eastern Plain Zone of U.P. The analysis was performed to assess the association between El-Nino episodes and rainfall and crop production & crop productivity of Eastern Plain Zone of UP. The average South-West monsoon rainfall, summer rainfall, winter rainfall, and total annual rainfall received during the years with El-Nino were found to be less as compared to normal years, In general, the South-West monsoon rainfall and the annual rainfall was found less during the El-Nino years. The average area, production, and productivity of crops were found to decrease during El-Nino years thereby indicating the risk associated with short duration crops grown under rainfed conditions during the Kharif season. The yield of long duration rabi crops like wheat, chickpea, pea, mustard, etc. grown either on residual soil moisture or irrigated were comparatively less affected during the El-Nino years. There is a need to enhance the agricultural production and productivity of crops during the El-Nino years. As the South-West monsoon rainfall and annual rainfall are likely to less than normal in the region. Short duration crops and varieties as main crops/intercropping system can be adopted in the zone. The productivity of Rabi crops can be improved by the judicious use of fertilizers and the adoption of insect pests & disease control during the early stages of its growth. Plantation crops like fruit and timber plants are likely to yield decline due to a decrease of pre-monsoon rainfall and therefore moisture conservation practices need to be adopted.

Keywords: Climatic variability, rainfall, El-Nino, production, productivity, major crops

Introduction
Rainfall is the direct source for both rainfed and irrigated agriculture. In general, it drives the agricultural productivity of India. The quantum and the distribution of rainfall determine agricultural productivity. In Eastern Plain Zone of Uttar Pradesh, it determines not only the crop selections during the Kharif season but also the crop sequences in double-cropping systems in rabi seasons. Thus the monsoon rainfall and its distribution are very crucial for crop success in Eastern Plain Zone of Uttar Pradesh. Some regions of India receive normal, some parts receive below normal, while some others receive above-normal rainfall. This type of spatial distribution of rainfall is important from the angle of agricultural planning. El-Nino is one of the most important factors that govern monsoonal rainfall over India. Assessment of the role of El-Nino on regional rainfall and agriculture has been attempted for the states of Andhra Pradesh (Rao. *et al.*, 2011) [7], Gujarat (Patel *et al.*, 2014) [5] and Karnataka (Venkatesh *et al* 2015) [8]. Among several factors that govern agricultural production, the weather appears to be the most critical factor as the farmers have no control over it, and its inter and intraseasonal variability' sare difficult to predict with greater reliability and confidence. So, the farmers generally believe that the weather in the coming year will be different from what they were aware of in the past. Prasanna (2014) [6] studied that the focuses on understanding the variations of precipitation during summer monsoon season and its impact on Kharif and rabi foodgrain yield over India. Total foodgrain yield over India during Kharif (summer) season is directly affected by variations in the summer monsoon precipitation (June-September). Hansen and Jones (2000) and Park (2001) [4] observed that recent advances in atmospheric and oceanic research, much of it focusing on El-Nino Southern oscillation and its teleconnections made it possible to forecast climate with useful skill with lead times of several months. Pandey *et al.* (2018) [3] analyzed the ENSO event has a profound impact on summer monsoonal rainfall across

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-10: 265-270

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-10 pp. 265-270
Journal homepage: http://www.ijcmas.com

Original Research Article

Nitrogen Level with Herbicidal Combination on Weed Flora in Wheat Crop

Shubham Singh[1]*, R.P. Singh[1], Ankit Kumar[1], A.K. Singh[1], Vivek Kumar Patel[2] and Kishan Kumar

[1]Department of Agronomy and [2]Department of Soil Science
A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya,
Uttar Pradesh- 224 229, India

**Corresponding author*

A B S T R A C T

An experiment was conducted at Agronomy research farm A.N.D.U.A.&T Kumarganj, Ayodhya during year 2017-18 on silty loam soil, having pH 8.6, EC 0.36 dSm-1, organic carbon 0.31%, available N, P and K 178.0, 14.5 and 231.5 kg ha^{-1} respectively. Experiment consisted of nine treatment combinations with three levels of nitrogen *viz.* 80, 120 and 160 kg N ha^{-1} and three herbicide treatments *viz.* pendimethalin *fb* 2, 4-D (1 + 0.5 kg a.i. ha^{-1}), clodinafop + metsulfuron(0.06 + 0.004 kg a.i. ha^{-1}) and sulfosulfuron (0.025 kg a.i. ha^{-1}). Results reveal that all the herbicides applied as post-emergence, except pendimethalin. Weed density and dry weight of weeds and nitrogen uptake by weeds increased consistently with increasing rate of nitrogen up to 160 kg N ha^{-1}. Post emergence application of clodinafop + metsulfuron (0.06 + 0.004 kg ha^{-1}) reduced the weed density and dry weight of weeds. Application of 160kg N $ha^{-1}$with clodinafop + metsulfuron (0.06 + 0.004 kg ha^{-1}) proved better to minimize the weed infestation and enhance the yield of wheat.

Keywords

Nitrogen level, Chemical herbicide, Weeds, Wheat

Introduction

Wheat is the fastest growing food grain in India and all set to overtake rice (113 million metric tonnes). The demand of wheat by 2020 has been projected to be between 105 to 109 million tonnes in the country. The increase in production has to be managed from integrated use of resources, as the land area under wheat is not expected to expand further. Weed alone causes average 30-33% reduction in wheat yield. Weeds are considered as one of the major constraints in wheat cultivation. In eastern U.P. wheat field was mainly infested with *Phalaris minor, Avenafatua, Chenopodium album, Cyperus rotundus, Convolvulus arvensis, Anagallis arvensis, Mililotus alba, Medicago denticulata* and *Cynodon dactylon* which compete for light, moisture, nutrients with crop(Singh *et al.,* 2013). The winter months are very cold whereas summers are hot and dry. Western hot winds start from the month of April and continue till the onset of monsoon. Weekly minimum and maximum temperatures during the crop season ranged from 5.50 to 17.20^{0}C and 18.34 to 37.60^{0}C and total rainfall received was 24.62 mm during the entire crop season.

Journal of Pharmacognosy and Phytochemistry 2020, 9(2) 446-449

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 446-449
Received: 24-01-2020
Accepted: 27-02-2020

Sumant Prasad
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manoj Kumar
Krishi Vigyan Kendra, Ganiwan, Chitrakoot, Uttar Pradesh, India

Corresponding Author:
Sumant Prasad
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of sowing temperature on growth & yield of Indian Mustard (*Brassica juncea* L.)

Sumant Prasad, AN Mishra, AK Singh and Manoj Kumar

Abstract
A field experiment was conducted during the *Rabi* season of 2015-16 to access the "Effect of sowing temperature on growth and yield of Indian Mustard (*Brassica juncea* L.)" in silty loam soil at Agro-meteorological Research Farm, N.D. University of Agriculture & Technology, Kumarganj, Faizabad. The experiment was conducted with nine treatment combinations consisted of three dates of sowing *viz.* D_1 (7th November), D_2 (17th November) and D_3 (27th November) and three cultivars *viz.* V_1 (Varuna), V_2 (NDR-8501) and V_3 (NDR-4). Results revealed that 7th November sown mustard crop produced significantly higher growth and yield due to fulfilment of optimum thermal requirement and solar light requirement for various processes of plant. Among the different cultivars of mustard, NDR-8501 was found more conducive for growth, development and thermal use efficiency as compared to Varuna and NDR-4. Higher seed yield (19.14q/ha) was recorded under 7th November sowing date having average temperature 24.4 °C as compared to 17th November (21.5 °C) sown mustard crop and 27th November (18.7 °C). Thermal unit (1796 °C days) and Photo-thermal index (84.06) from sowing to maturity produced the high yield of Indian mustard.

Keywords: sowing temperature, Indian mustard, sown mustard crop

Introduction
Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max* L.) and palm (*Elaeis guineensis* Jacq.) oil. It is grown in subtropical and tropical countries in the world comprise eight cultivated crops of tribe Brassiceae within the family Cruciferae (Brassicaceae). Cool temperature, dry weather with good amount of bright sunshine increases the oil yield. Mustard needs high temperature for vegetative growth (20 °C-32 °C) and cool temperature with clear sky during reproductive growth and maturity. Rapeseed - mustard follows C_3 pathway for carbon assimilation. Therefore, it has efficient photosynthetic response at 15 °C to 20 °C temperature. Rapeseed–mustard crops are grown in diverse agro-climatic conditions ranging from north-eastern/ north-western hills to down south under irrigated/rainfed, timely/ late-sown, saline soils and mixed cropping. Production potentiality of Indian mustard can be fully exploited under these conditions with suitable agronomic practices and varieties.

Among the different agronomic practices, optimum sowing time is very important for mustard production (Mondal and Islam, 1993; Mondal *et al.*, 1999) [2, 3]. Research findings have also shown that sowing date is one of the critical components affecting mustard crop productivity. It is one of the most important agronomic factor and non-monetary input which pave the way for better-use of time and play an important role to fully exploit the genetic potentiality of a variety as it provides optimum growth conditions such as temperature, light, humidity and rainfall. Sowing period information is needed for various other purposes like adjusting crop rotations; cropping patterns, crop growth simulations and climate change impact studies. The temperature and solar radiation play an important role in partitioning of biomass between various organs of plant which is related to, and often governed by phenological phase of the plant and the way in which a crop develops can affect the yield and yield attributes.

The growth phase of the crop should synchronize with optimum environmental conditions for better expression of growth and yield. It is a fact that specified genotypes does not exhibit the same phenotypic characteristics in all environmental conditions. Bora (1997) has reported that the yield potential of different mustard varieties may differ under different agro-climatic conditions because of their inherent capacity. The different genotype growth response varies to different environment and their relative ranking usually differ and ultimately decides the selection of genotypes for a particular or different sowing dates for stabilized higher yields (Eberhort and Russel, 1966 and Perkins and Jinks, 1968) [1, 4]. The mustard genotypes differ in their yielding ability, this calls for a need to generate more information on the response of

Journal of Pharmacognosy and Phytochemistry 2020; 9(2): 187-193

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 187-193
Received: 12-01-2020
Accepted: 15-02-2020

Sumant Prasad
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AN Mishra
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manoj Kumar
Krishi Vigyan Kendra, Ganiwan, Chitrakoot, Uttar Pradesh, India

Corresponding Author:
Sumant Prasad
Department of Agriculture Meteorology N.D. University of Agriculture & Technology, Kumarganj, Faizabad

Climatic variability analysis of district Bahraich of Uttar Pradesh

Sumant Prasad, AN Mishra, AK Singh and Manoj Kumar

Abstract
The historical data of weather parameters especially rainfall and temperature (maximum and minimum) of district Bahraich of U.P were collected for study from the period of 1987-2016. Result reveals that in district Bahraich of U.P., the annual trend of rainfall have been studied using annual data series of 30 years (1987-2016) and divided into three decades which is 1987-1996, 1997-2006 and 2007-2016 respectively. Annual rainfall of Bahraich gradually declined over the normal 1036.2 (mm) in recent years. Annual average maximum temperature of district Bahraich of U.P. was found increasing trend over normal average maximum temperature (31.1 ^{0}C) during 30years (1987-2016) period. Rise in average maximum temperature by 2.2 ^{0}C was found in the year 2009 over the normal temperature of district Bahraich of U.P. A slight increasing trend of average minimum temperature of about 1.92^{0}C over the normal average minimum temperature (18.08 ^{0}C) was observed. Average temperature was increased by 1.7 ^{0}C over normal average temperature within this 30 years period. A decreasing trend of rainfall and increasing trend of both maximum and minimum temperature resulted into decreased agricultural production with respect to the present grain need scenario for the world population.

Keywords: Rainfall trend, annual rainfall variability, decadal, linear regression analysis

Introduction
Agriculture and related sectors, food security and energy security of India are crucially dependent on the timely availability of adequate amount of water and a conducive climate. The rainfall received in an area is an important factor in determining the amount of water available to meet various demands such as agricultural, industrial, domestic water supply and for hydroelectric power generation. Global climate changes may influence long-term rainfall patterns impacting the availability of water along with the danger of increasing occurrences of droughts and floods. Changes in climate over the Indian region, particularly the SW monsoon, would have a significant impact on agricultural production, water resources management and overall economy of the country. The heavy concentration of rainfall in the monsoon months (June-September) results in scarcity of water in many parts of the country during the non-monsoon periods.

Change in rainfall due to global warming or after 1990's (after industrialization) in the country, may influence the hydrological cycle and rainfall pattern. This compelled to review the demand of water hydrological design and agricultural practices. Therefore, long term trend analysis of rainfall and other weather parameters on different spatial scales will help in framing the future scenario for crop planning and management (Jain & Kumar, 2012) [2]. Keeping above facts in view the present investigation was under taken.

Materials and Methods
The rainfall data of last 30 years (1987-2016) of Bahraich (Uttar Pradesh) were collected. Data were analyzed for observing the past trend of rainfall and temperature. Bahraich is situated at 27°58' N Latitude, 81°55' E Longitude and altitude 126 m at mean sea level (MSL). Bahraich comes under North Eastern Plain Zone U.P. state in India. In North Eastern Plain Zone, consists of 11 districts, namely Bahraich, Shravasti, Gonda, Balrampur, Basti, Siddharthnagar, Sant Kabir Nagar, Gorakhpur, Maharajganj, Padrauna and Deoria. Eastern parts of U.P. has been divided into three agro-climatic zones, namely North eastern plain zone (NEPZ), Eastern plain zone (EPZ) and Vindhyan zone (VZ). As Eastern U.P. stretches from North India towards Eastern, the rainfall of NEPZ of U.P. is higher about 1270 mm as compared to other region of eastern U.P. and with drawl of monsoon is also in similar trend i.e. earlier in NEPZ. Trend analysis for different climatic parameters were done for the Bahraich district of NEPZ region.

Int.J.Curr.Microbiol.App.Sci (2020) 9(2): 2935-2941

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 2 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.902.334

Influence of Planting Geometry and Nitrogen Levels on Growth and Yield of Rice (*Oryza sativa L.*) under Eastern Uttar Pradesh Condition

Pradeep Rajput[1*], A. K.Singh[1], Ravindra Kumar Rajput[2] and Prithvi Raj[1]

[1]*Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, U.P., India*
[2]*Department of Soil Science & Agricultural Chemistry, Matter specialist (soil science), KVK Mathura, U.P., India, India*

**Corresponding author*

Keywords

Planting geometry, Growth, Yield, Nitrogen levels, Rice, Dry matter, Flowering and Harvest Index.

Article Info

Accepted:
20 January 2020
Available Online:
10 February 2020

ABSTRACT

Field experiment was conducted during *kharif*-2017 at Agronomy Research Farm, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Faizabad, Uttar Pradesh, to study the effect of planting geometry and nitrogen levels on growth of rice (*Oryza sativa* L.). In this experiment, 4 planting geometry (15x10cm, 15x15cm, 20x10cm and 20x15cm) and 4 Nitrogen levels (0, 60, 120 and 180 kg ha^{-1}) were tested in SPD with 3 replications. The crop received a total rainfall of 804.9mm while the evaporation was 126.1 mm during the entire crop season. The results showed that the plant height, number of tillers m^{-2}, leaf-area index and dry matter accumulation m^{-2}, being at par with 20x15 cm spacing were significantly higher under 20x10 cm than rest of the planting geometry. Nitrogen is also responsible for more leaf area and dry matter production due to higher rate of cell division and cell elongation. The application of nitrogen @ 120 kg N ha^{-1}, being at par with 180 kg N ha^{-1} significantly improved the plant height, number of tillers m^{-2}, leaf area index and dry matter accumulation m^{-2} than rest of the Nitrogen levels. The highest grain and biological yields were also noticed at 20x10 cm spacing and 180 kg N ha^{-1}.

Introduction

Rice (*Oryza sativa* L.) is a most important cereal crop, grown under semi-aquatic condition and mostly under submergence or variable ponding conditions. It is a most important staple food of about more than 60% of total world population. Rice is a nutritious cereal crop, mainly used for human consumption. It is the main source of energy and is an important source of protein providing substantial amounts of the recommended nutrients intake of zinc and niacin. Planting geometry of a crop affects the interception of solar radiation, crop canopy coverage, dry matter accumulation and crop

The Pharma Innovation Journal 2020; 9(9): 340-342

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(9): 340-342
© 2020 TPI
www.thepharmajournal.com
Received: 16-07-2020
Accepted: 19-08-2020

Rakesh Kumar Kushwaha
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AN Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SR Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Pandey
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Arun Kumar
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Suraj Kumar
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
AN Mishra
Department of Agricultural Meteorology A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of El-Nino on rainfall and temperature of Eastern Plain Zone of Uttar Pradesh

Rakesh Kumar Kushwaha, AK Singh, AN Mishra, SR Mishra, Alok Kumar Pandey, Arun Kumar and Suraj Kumar

Abstract
District wise monthly rainfall data of Eastern Plain Zone of Uttar Pradesh recorded during the years 1981 to 2017 were used in the present study. The rainfall totals for the summer (March to May), South-West monsoon (June to September), rabi (October to December) and winter (January to February) seasons were computed year wise for various districts of Eastern Plain Zone of U.P. The inter-seasonal and intra-seasonal variability in weather is believed in recent years to outsmart the abilities of climatologist and statisticians in defining the limits within which these variabilities can be observed. El-Nino is a pervasive climatic phenomenon that was found to be associated with regional climate variations throughout the world. Analysis of long term data suggests an inverse relationship between El-Nino and South-West monsoon rainfall. However, there is no one to one relationship as El-Nino years have not always produced severe drought. The analysis was performed to assess the association between El-Nino episodes on rainfall and temperature in the Eastern Plain Zone of U.P. The average South-West monsoon rainfall, summer rainfall, Winter rainfall, and total annual rainfall received during the years with El-Nino were found to be less compared to normal years, In general, it was observed that the South-West monsoon rainfall and the annual rainfall was found less during the El-Nino years. The mean annual temperature was found not to vary much during El-Nino years.

Keywords: rainfall, temperature, drought, monsoon, weather, climate variation

Introduction
Rainfall is the direct source for both rainfed and irrigated agriculture. In general, it drives the agricultural productivity of India. The quantum and the distribution of rainfall determine agricultural productivity. In Eastern Plain Zone of Uttar Pradesh, It determines not only the crop selections during the Kharif season but also the crop sequences in double-cropping systems during rabi seasons. Thus the monsoon rainfall and its distribution are very crucial for crop success in Eastern Plain Zone of Uttar Pradesh. It is known that whatever be the quantum of rainfall over India, some regions of India receive normal, some parts receive below normal, while some others receive above-normal rainfall. This type of spatial distribution of rainfall is important from the angle of agricultural planning. El-Nino is one of the most important factors that govern monsoonal rainfall over India. Assessment of the role of El-Nino on regional rainfall and agriculture has been attempted for the states of Andhra Pradesh (Rao *et al*., 2011) [5], Gujarat (Patel *et al*., 2014) [4] and Karnataka (Venkatesh *et al*., 2015) [7]. Among several factors that govern agricultural production, the weather appears to be the most critical factor as the farmers have no control over it and its inter and intraseasonal variability are difficult to predict with greater reliability and confidence. So, the farmers generally believe that the weather in the coming year will be different from what they were aware of in the past. In tropical countries like India, a region may experience a dry spell because no storms happen to pass that way for a time. Prediction of such stochastic events is not possible. Climatologists, now see, however, that many climatic variations are part of large scale, slowly evolving patterns. Many critical agricultural decisions from farm to policy level must be made several months before those weather conditions are experienced. Kothawale *et al.* (2010) observed that the during period 1901 to 2007 Indian annual mean, maximum and minimum temperature showed significant warming trends of 0.51 °C, 0.72 °C, and 0.27 °C 100 year^{-1}, respectively. However, severe warming in the recent decade 1998-2007 has accelerated the warming during 1971–2007. The mean, maximum, minimum temperatures have increased by about 0.2 °C per decade for the period 1971-2007. Asseng *et al.* (2010) [1] observed variations in average growing-season temperatures of ±2 °C in the main wheat growing regions of Australia can

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(1): 2327-2330
Received: 19-11-2019
Accepted: 21-12-2019

Shashank Shekher Singh
Department of Agronomy
N.D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Department of Agronomy
N.D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Permendra Singh
Advanced Center for Rainfed Agriculture, Dhiansar, SKUAST-Jammu, Jammu & Kashmir, India

Corresponding Author:
Permendra Singh
Advanced Center for Rainfed Agriculture, Dhiansar, SKUAST-Jammu, Jammu & Kashmir, India

To study the influence of planting geometry and nitrogen level on quality attributes nitrogen uptake and economics of rice (*Oryza sativa* L.) under upper gangetic plains region of India

Shashank Shekher Singh, Anil Kumar Singh and Permendra Singh

Abstract
A field experiment was conducted for two years during kharif season of 2017 and 2018 at Agronomy research Farm, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) on sandy loam soil with a pH of 8.1 to study the Influence of planting geometry and nitrogen levels on rice (*Oryza sativa* L.)". The experiment was laid out in split plot design (SPD) with three replications Sixteen treatment combinations; comprised of four planting geometry, viz. (S_1) 15x10 cm, 15x15 (S_2),20x10 (S_3) and 20x15 (S_4) were kept in main plot and four nitrogen level, viz. 0kg/ha (N_0), 60kg/ha (N_1), 120kg/ha (N_2) and 180kg/ha (N_3) were kept in sub plot. Protein content of rice grain was not significantly affected due to planting geometry and N level during both the years of investigation, whereas plant spacing of 20×10cm recorded higher nitrogen uptake in grain which was at par with 15×15cm spacing while significant over rest both of the planting geometry. Cost of cultivation was recorded highest (Rs. 35435/ha) under S_1N_3 under planting geometry of 15×10cm spacing applied with 180kg N/ha followed by (Rs.35045/ha), while application of 120kg nitrogen/ha given in 20×10cm spacing recorded highest gross return Rs.102140/ha followed by Rs. 101845/ha in 15×15cm spacing applied with 180kg N/ha due to higher yield.

Keywords: Planting geometry, nitrogen level, *Oryza sativa* L.

Introduction
Rice (*Oryza sativa* L.) is the primary staple food of India as well as world. More than 60% of the world's population providing major source of the food energy. Globally, total rice consumption was recorded 491.5 million metric tonnes in 2014-15 (Anonymous, 2015-16) [1]. It is the important crop in the country's food security accounting about 44% of the total food grain production and holds about 20% share in national agricultural GDP and provides 43% calorie requirement for more than 70% of Indians.

It is grown in 114 countries across the world on an area about 160 million hectares with annual production of 494.3 million tonnes, and total supply of 711.5 million tonnes (Anonymous, 2015-16) [1]. Plant spacing is also an important factor that needs to be considered during transplanting of rice. Rice plants compete among themselves for space, nutrients, water, sunlight, air. Proper spacing may help to increase maximum leaf Area Index (LAI), light interceptions etc. which are required for better photosynthesis as well as yield of rice.

Nitrogen plays a key role in rice production and it is required in large amount. It is one of the most important limiting nutrient in rice production and has heavy system losses when applied as inorganic sources in puddled field. Nitrogen has a positive influence on the production of effective tillers per plant, yield and yield attributes. It is necessary to find out the suitable dose of nitrogen for efficient management and better yield of rice. A suitable planting geometry and dose of nitrogen is necessary for better yield.

Material and Methods
The field experiment was conducted during Kharif 2017 and Kharif 2018 at Agronomy Research Farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). Geographically the experimental site is situated at 26°.47' North latitude and 81°.12' East longitude with is an altitude of 113 m. from mean sea level in the Indo Gangatic Plain Zone of Eastern Uttar Pradesh. The climate in this region is sub humid. The soil is sandyloam with a pH of 8.1. Sixteen treatment combinations; comprised of four planting geometry, viz. (S_1) 15x10 cm, 15x15 (S_2),20x10 (S_3) and 20x15 (S_4) were kept

The Pharma Innovation Journal 2021; 10(9): 1631-1632

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 1631-1632
© 2021 TPI
www.thepharmajournal.com
Received: 15-07-2021
Accepted: 20-08-2021

Shubhranshu Singh
Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Rajkumar Pathak
Associate Professors, Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy,

Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak and Rajkumar Pathak

Abstract
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) *varieties."* during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher yield and economics of potato.

Keywords: Potato varieties, irrigation scheduling, tuber & haulm yield, economics

Introduction
Potato is herbaceous annual plant and belongs to the family solanaceae. It has been brought to India from Europe. Ranked of potato by United Nation as the world's 4th most important food crop after rice, wheat and Maize (Anonymous 2006). It is among one of the most diverse and nutritious crop on the earth and content approximately 78% water 22% dry matter and less than 1% fat potato contains at least 12 essential amino acid, Minerals and is also source of vitamin C, thiamine, Iron and Folic acid. It is a good source of Carbohydrates with low fat contains which makes its balance food due to high protein calorie ratio (70 gm protein: 1000 kcal) and short vegetative cycle, potatoes yield substantially more edible energy, protein and dry matter per unit area per unit time. A field experiment on sandy loam soil during winter season of 2004-05 and 2005-06 at Indian Agricultural Research Institute, New Delhi. The treatments comprised of 5 irrigation levels (irrigation at critical stages of potato (Solanum tuberosum L.), irrigation at critical stages of French bean (Phaseolus vulgaris L.), and irrigation at 0.8, 1.2 and 1.6 IW/CPE ratio) as main plots and 3 cropping systems (sole potato, sole French bean and potato + French bean in 2:3 row ratio). Irrigation at IW/CPE ratio of 1.6 produced the highest tuber yield followed by irrigation at 1.2 IW/CPE ratios, while the lowest tuber yield was achieved with irrigation at 0.8 IW/CPE ratios (Tyagi *et al,* 2012) [7].

Materials and Methods
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019.

Result and Discussion
Tuber and Haulm Yield (q/ha)
Tuber yield and haulm yield (q ha^{-1}) as influenced by various irrigation scheduling and potato

The Pharma Innovation Journal 2021; 10(9): 1631-1632
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 1631-1632
© 2021 TPI
www.thepharmajournal.com
Received: 15-07-2021
Accepted: 20-08-2021

Shubhranshu Singh
Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Rajkumar Pathak
Associate Professors, Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy,

Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak and Rajkumar Pathak

Abstract
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) *varieties.*" during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher yield and economics of potato.

Keywords: Potato varieties, irrigation scheduling, tuber & haulm yield, economics

Introduction
Potato is herbaceous annual plant and belongs to the family solanaceae. It has been brought to India from Europe. Ranked of potato by United Nation as the world's 4th most important food crop after rice, wheat and Maize (Anonymous 2006). It is among one of the most diverse and nutritious crop on the earth and content approximately 78% water 22% dry matter and less than 1% fat potato contains at least 12 essential amino acid, Minerals and is also source of vitamin C, thiamine, Iron and Folic acid. It is a good source of Carbohydrates with low fat contains which makes its balance food due to high protein calorie ratio (70 gm protein: 1000 kcal) and short vegetative cycle, potatoes yield substantially more edible energy, protein and dry matter per unit area per unit time. A field experiment on sandy loam soil during winter season of 2004-05 and 2005-06 at Indian Agricultural Research Institute, New Delhi. The treatments comprised of 5 irrigation levels (irrigation at critical stages of potato (Solanum tuberosum L.), irrigation at critical stages of French bean (Phaseolus vulgaris L.), and irrigation at 0.8, 1.2 and 1.6 IW/CPE ratio) as main plots and 3 cropping systems (sole potato, sole French bean and potato + French bean in 2:3 row ratio). Irrigation at IW/CPE ratio of 1.6 produced the highest tuber yield followed by irrigation at 1.2 IW/CPE ratios, while the lowest tuber yield was achieved with irrigation at 0.8 IW/CPE ratios (Tyagi *et al,* 2012) [7].

Materials and Methods
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019.

Result and Discussion
Tuber and Haulm Yield (q/ha)
Tuber yield and haulm yield (q ha^{-1}) as influenced by various irrigation scheduling and potato

The Pharma Innovation Journal 2021; 10(9): 1631-1632
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 1631-1632
© 2021 TPI
www.thepharmajournal.com
Received: 15-07-2021
Accepted: 20-08-2021

Shubhranshu Singh
Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Rajkumar Pathak
Associate Professors, Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy,

Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak and Rajkumar Pathak

Abstract
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) *varieties."* during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz*. K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz*. No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher yield and economics of potato.

Keywords: Potato varieties, irrigation scheduling, tuber & haulm yield, economics

Introduction
Potato is herbaceous annual plant and belongs to the family solanaceae. It has been brought to India from Europe. Ranked of potato by United Nation as the world's 4th most important food crop after rice, wheat and Maize (Anonymous 2006). It is among one of the most diverse and nutritious crop on the earth and content approximately 78% water 22% dry matter and less than 1% fat potato contains at least 12 essential amino acid, Minerals and is also source of vitamin C, thiamine, Iron and Folic acid. It is a good source of Carbohydrates with low fat contains which makes its balance food due to high protein calorie ratio (70 gm protein: 1000 kcal) and short vegetative cycle, potatoes yield substantially more edible energy, protein and dry matter per unit area per unit time. A field experiment on sandy loam soil during winter season of 2004-05 and 2005-06 at Indian Agricultural Research Institute, New Delhi. The treatments comprised of 5 irrigation levels (irrigation at critical stages of potato (Solanum tuberosum L.), irrigation at critical stages of French bean (Phaseolus vulgaris L.), and irrigation at 0.8, 1.2 and 1.6 IW/CPE ratio) as main plots and 3 cropping systems (sole potato, sole French bean and potato + French bean in 2:3 row ratio). Irrigation at IW/CPE ratio of 1.6 produced the highest tuber yield followed by irrigation at 1.2 IW/CPE ratios, while the lowest tuber yield was achieved with irrigation at 0.8 IW/CPE ratios (Tyagi *et al*, 2012) [7].

Materials and Methods
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz*. K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz*. No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019.

Result and Discussion
Tuber and Haulm Yield (q/ha)
Tuber yield and haulm yield (q ha^{-1}) as influenced by various irrigation scheduling and potato

The Pharma Innovation Journal 2021; 10(9): 1631-1632

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 1631-1632
© 2021 TPI
www.thepharmajournal.com
Received: 15-07-2021
Accepted: 20-08-2021

Shubhranshu Singh
Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Rajkumar Pathak
Associate Professors, Department of Soil Science and Agricultural Chemistry, ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy,

Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak and Rajkumar Pathak

Abstract
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) *varieties.*" during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher yield and economics of potato.

Keywords: Potato varieties, irrigation scheduling, tuber & haulm yield, economics

Introduction
Potato is herbaceous annual plant and belongs to the family solanaceae. It has been brought to India from Europe. Ranked of potato by United Nation as the world's 4th most important food crop after rice, wheat and Maize (Anonymous 2006). It is among one of the most diverse and nutritious crop on the earth and content approximately 78% water 22% dry matter and less than 1% fat potato contains at least 12 essential amino acid, Minerals and is also source of vitamin C, thiamine, Iron and Folic acid. It is a good source of Carbohydrates with low fat contains which makes its balance food due to high protein calorie ratio (70 gm protein: 1000 kcal) and short vegetative cycle, potatoes yield substantially more edible energy, protein and dry matter per unit area per unit time. A field experiment on sandy loam soil during winter season of 2004-05 and 2005-06 at Indian Agricultural Research Institute, New Delhi. The treatments comprised of 5 irrigation levels (irrigation at critical stages of potato (Solanum tuberosum L.), irrigation at critical stages of French bean (Phaseolus vulgaris L.), and irrigation at 0.8, 1.2 and 1.6 IW/CPE ratio) as main plots and 3 cropping systems (sole potato, sole French bean and potato + French bean in 2:3 row ratio). Irrigation at IW/CPE ratio of 1.6 produced the highest tuber yield followed by irrigation at 1.2 IW/CPE ratios, while the lowest tuber yield was achieved with irrigation at 0.8 IW/CPE ratios (Tyagi *et al,* 2012) [7].

Materials and Methods
A field experiment was conducted on the topic entitled "Response of irrigation scheduling on yield and economics of potato (*Solanum tuberosum* L.) varieties." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019.

Result and Discussion
Tuber and Haulm Yield (q/ha)
Tuber yield and haulm yield (q ha^{-1}) as influenced by various irrigation scheduling and potato

The Pharma Innovation Journal 2021; 10(11): 30-32

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(11): 30-32
© 2021 TPI
www.thepharmajournal.com
Received: 10-07-2021
Accepted: 14-08-2021

Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Shubhendu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Pooja Yadav
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy, Narendra Deva of Agriculture and

Effect of different varieties of potato on irrigation scheduling in terms of growth and yields

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak, Shubhendu Singh and Pooja Yadav

Abstract
A field experiment was conducted on the topic entitled "Effect of different varieties of potato on irrigation scheduling in terms of growth and yields." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz*. K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz*. No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher in terms of growth and yields.

Keywords: Varieties of potato, irrigation scheduling, growth, plant height, number of haulm, tuber yield and yields

1. Introduction

The potato is a starchy tuber of the plant *Solanum tuberosum* and is a root vegetable native to the Americas, with the plant itself being a perennial in the nightshade family Solanaceae. Potatoes were introduced from the Americas to Europe in the second half of the 1+6th century by the Spanish. Now a dayds potatoes are a staple food in many parts of the world and an integral part of much of the world's food supply. As of 2014, potatoes were the world's 4th largest food crop after maize, wheat, and rice. A typical raw potato is 79% water, 17% carbohydrates (88% is starch), 2% protein, and contains negligible fat (see table) according to the United States Department of Agriculture. In a 100-gram (3½-ounce) portion, raw potato provides 322 kilojoules (77 kilocalories) of food energy and is a rich source of Vitamin B6 and Vitamin C (23% and 24% of the Daily Value, respectively), with no other vitamins or minerals in significant amount (see table). The potato is rarely eaten raw because raw potato starch is poorly digested by humans. When a potato is baked, its contents of vitamin B6 and vitamin C decline notably, while there is little significant change in the amount of other nutrients. The cultivated area is about 2.7 million hectares irrigated by surface irrigation from total cultivated area of 3.9 million hectares according to data issued by Ministry of Agriculture, Egypt in 2013. Despite this progressive water shortage farmer continue to use surface irrigation. Poor management, uniformity and distribution of water have been cited as the most frequent problems of surface irrigation, resulting in waterlogging, salinization and less water use efficiency (AbouKheira, 2009) [1]. Potato is considered one of the main important vegetable ranks as manufacture and export crop among the different vegetable crops in Egypt. About 178 thousand hectares are only cultivated in spring and winter seasons. Total production of potato in Egypt is about four million tons per year.

Irrigation scheduling is defined as deciding when to irrigate and how much water to apply. Several types of irrigation scheduling have been documented. Martin *et al*. (1990) classified methods of irrigation scheduling as belonging to one of two broad groups: soil water balance computations, and soil and/or crop monitoring techniques. Deficit irrigation lowers yield due to reduced leaf area and/or reduced photosynthesis per unit leaf area. (Van Loon, 1981) [9] Wateris the vital source for crop production and is the most limiting factor in Indian agriculture.

The Pharma Innovation Journal 2021; 10(11): 30-32

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(11): 30-32
© 2021 TPI
www.thepharmajournal.com
Received: 10-07-2021
Accepted: 14-08-2021

Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Shubhendu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Pooja Yadav
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and

Effect of different varieties of potato on irrigation scheduling in terms of growth and yields

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak, Shubhendu Singh and Pooja Yadav

Abstract
A field experiment was conducted on the topic entitled "Effect of different varieties of potato on irrigation scheduling in terms of growth and yields." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher in terms of growth and yields.

Keywords: Varieties of potato, irrigation scheduling, growth, plant height, number of haulm, tuber yield and yields

1. Introduction

The potato is a starchy tuber of the plant *Solanum tuberosum* and is a root vegetable native to the Americas, with the plant itself being a perennial in the nightshade family Solanaceae. Potatoes were introduced from the Americas to Europe in the second half of the 1+6th century by the Spanish. Now a dayds potatoes are a staple food in many parts of the world and an integral part of much of the world's food supply. As of 2014, potatoes were the world's 4th largest food crop after maize, wheat, and rice. A typical raw potato is 79% water, 17% carbohydrates (88% is starch), 2% protein, and contains negligible fat (see table) according to the United States Department of Agriculture. In a 100-gram (3½-ounce) portion, raw potato provides 322 kilojoules (77 kilocalories) of food energy and is a rich source of Vitamin B6 and Vitamin C (23% and 24% of the Daily Value, respectively), with no other vitamins or minerals in significant amount (see table). The potato is rarely eaten raw because raw potato starch is poorly digested by humans. When a potato is baked, its contents of vitamin B6 and vitamin C decline notably, while there is little significant change in the amount of other nutrients. The cultivated area is about 2.7 million hectares irrigated by surface irrigation from total cultivated area of 3.9 million hectares according to data issued by Ministry of Agriculture, Egypt in 2013. Despite this progressive water shortage farmer continue to use surface irrigation. Poor management, uniformity and distribution of water have been cited as the most frequent problems of surface irrigation, resulting in waterlogging, salinization and less water use efficiency (AbouKheira, 2009) [1]. Potato is considered one of the main important vegetable ranks as manufacture and export crop among the different vegetable crops in Egypt. About 178 thousand hectares are only cultivated in spring and winter seasons. Total production of potato in Egypt is about four million tons per year.

Irrigation scheduling is defined as deciding when to irrigate and how much water to apply. Several types of irrigation scheduling have been documented. Martin *et al.* (1990) classified methods of irrigation scheduling as belonging to one of two broad groups: soil water balance computations, and soil and/or crop monitoring techniques. Deficit irrigation lowers yield due to reduced leaf area and/or reduced photosynthesis per unit leaf area. (Van Loon, 1981) [9] Wateris the vital source for crop production and is the most limiting factor in Indian agriculture.

The Pharma Innovation Journal 2021; 10(11): 30-32

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(11): 30-32
© 2021 TPI
www.thepharmajournal.com
Received: 10-07-2021
Accepted: 14-08-2021

Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Shubhendu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Pooja Yadav
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and

Effect of different varieties of potato on irrigation scheduling in terms of growth and yields

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak, Shubhendu Singh and Pooja Yadav

Abstract
A field experiment was conducted on the topic entitled "Effect of different varieties of potato on irrigation scheduling in terms of growth and yields." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher in terms of growth and yields.

Keywords: Varieties of potato, irrigation scheduling, growth, plant height, number of haulm, tuber yield and yields

1. Introduction

The potato is a starchy tuber of the plant *Solanum tuberosum* and is a root vegetable native to the Americas, with the plant itself being a perennial in the nightshade family Solanaceae. Potatoes were introduced from the Americas to Europe in the second half of the 1+6th century by the Spanish. Now a dayds potatoes are a staple food in many parts of the world and an integral part of much of the world's food supply. As of 2014, potatoes were the world's 4th largest food crop after maize, wheat, and rice. A typical raw potato is 79% water, 17% carbohydrates (88% is starch), 2% protein, and contains negligible fat (see table) according to the United States Department of Agriculture. In a 100-gram (3½-ounce) portion, raw potato provides 322 kilojoules (77 kilocalories) of food energy and is a rich source of Vitamin B6 and Vitamin C (23% and 24% of the Daily Value, respectively), with no other vitamins or minerals in significant amount (see table). The potato is rarely eaten raw because raw potato starch is poorly digested by humans. When a potato is baked, its contents of vitamin B6 and vitamin C decline notably, while there is little significant change in the amount of other nutrients. The cultivated area is about 2.7 million hectares irrigated by surface irrigation from total cultivated area of 3.9 million hectares according to data issued by Ministry of Agriculture, Egypt in 2013. Despite this progressive water shortage farmer continue to use surface irrigation. Poor management, uniformity and distribution of water have been cited as the most frequent problems of surface irrigation, resulting in waterlogging, salinization and less water use efficiency (AbouKheira, 2009) [1]. Potato is considered one of the main important vegetable ranks as manufacture and export crop among the different vegetable crops in Egypt. About 178 thousand hectares are only cultivated in spring and winter seasons. Total production of potato in Egypt is about four million tons per year.

Irrigation scheduling is defined as deciding when to irrigate and how much water to apply. Several types of irrigation scheduling have been documented. Martin *et al.* (1990) classified methods of irrigation scheduling as belonging to one of two broad groups: soil water balance computations, and soil and/or crop monitoring techniques. Deficit irrigation lowers yield due to reduced leaf area and/or reduced photosynthesis per unit leaf area. (Van Loon, 1981) [9] Wateris the vital source for crop production and is the most limiting factor in Indian agriculture.

The Pharma Innovation Journal 2021; 10(11): 30-32

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(11): 30-32
© 2021 TPI
www.thepharmajournal.com
Received: 10-07-2021
Accepted: 14-08-2021

Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professors and Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Devesh Pathak
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Shubhendu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Pooja Yadav
Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shubhranshu Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture and

Effect of different varieties of potato on irrigation scheduling in terms of growth and yields

Shubhranshu Singh, Anil Kumar Singh, Devesh Pathak, Shubhendu Singh and Pooja Yadav

Abstract
A field experiment was conducted on the topic entitled "Effect of different varieties of potato on irrigation scheduling in terms of growth and yields." during the Rabi season of 2019-20 at Main Experiment Statin, Vegetable Research Farm, A. N D. University of Agriculture & Technology Kumarganj, Ayodhya. The treatment consisted of five potato varieties *viz.* K. Ashoka, K. Bahar, K. Neelkanth, K. Khyati, K. Sadabahar, and two irrigation scheduling *viz.* No Water Stress and Water Stress. The experiment was conducted in Factorial RBD and replicated three times. The soil of the experimental field was low in organic carbon (0.40%) and nitrogen (142.57 kg ha^{-1}), medium in available phosphorus (15.73 kg ha^{-1}), and high in potassium (242.23 kg ha^{-1}) with pH 8.3. The planting was done on 3rd November 2019. Among the various irrigation scheduling and potato varieties measure, Kufari Khyati irrigated with No Water Stress recorded higher in terms of growth and yields.

Keywords: Varieties of potato, irrigation scheduling, growth, plant height, number of haulm, tuber yield and yields

1. Introduction

The potato is a starchy tuber of the plant *Solanum tuberosum* and is a root vegetable native to the Americas, with the plant itself being a perennial in the nightshade family Solanaceae. Potatoes were introduced from the Americas to Europe in the second half of the 1+6th century by the Spanish. Now a dayds potatoes are a staple food in many parts of the world and an integral part of much of the world's food supply. As of 2014, potatoes were the world's 4th largest food crop after maize, wheat, and rice. A typical raw potato is 79% water, 17% carbohydrates (88% is starch), 2% protein, and contains negligible fat (see table) according to the United States Department of Agriculture. In a 100-gram (3 1⁄2-ounce) portion, raw potato provides 322 kilojoules (77 kilocalories) of food energy and is a rich source of Vitamin B6 and Vitamin C (23% and 24% of the Daily Value, respectively), with no other vitamins or minerals in significant amount (see table). The potato is rarely eaten raw because raw potato starch is poorly digested by humans. When a potato is baked, its contents of vitamin B6 and vitamin C decline notably, while there is little significant change in the amount of other nutrients. The cultivated area is about 2.7 million hectares irrigated by surface irrigation from total cultivated area of 3.9 million hectares according to data issued by Ministry of Agriculture, Egypt in 2013. Despite this progressive water shortage farmer continue to use surface irrigation. Poor management, uniformity and distribution of water have been cited as the most frequent problems of surface irrigation, resulting in waterlogging, salinization and less water use efficiency (AbouKheira, 2009) [1]. Potato is considered one of the main important vegetable ranks as manufacture and export crop among the different vegetable crops in Egypt. About 178 thousand hectares are only cultivated in spring and winter seasons. Total production of potato in Egypt is about four million tons per year.

Irrigation scheduling is defined as deciding when to irrigate and how much water to apply. Several types of irrigation scheduling have been documented. Martin *et al.* (1990) classified methods of irrigation scheduling as belonging to one of two broad groups: soil water balance computations, and soil and/or crop monitoring techniques. Deficit irrigation lowers yield due to reduced leaf area and/or reduced photosynthesis per unit leaf area. (Van Loon, 1981) [9] Wateris the vital source for crop production and is the most limiting factor in Indian agriculture.

The Pharma Innovation Journal 2021; 10(10): 2667-2669
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 2667-2669
© 2021 TPI
www.thepharmajournal.com
Received: 15-08-2021
Accepted: 26-09-2021

Shashank Shekher Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Pradeep Rajput
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Permendra Singh
Department of Agronomy, Advanced Center for Rainfed Agriculture, Dhiansar, SKUAST, Jammu, Jammu and Kashmir, India

Corresponding Author:
Shashank Shekher Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Effect of different planting density and nitrogen levels on growth characters and yield of rice (*Oryza sativa*) grown under eastern Uttar Pradesh

Shashank Shekher Singh, AK Singh, Pradeep Rajput and Permendra Singh

Abstract
The experimental result revealed that different planting geometry and level of nitrogen had a remarkable influence on almost all the growth characters and yield of rice. Growth characters, *viz.* plant height, number of tillers/m^2, Leaf area index, dry matter accumulation/m^2 were increased significantly with the increasing level of nitrogen from 0 to 180 kg/ha in both of year. On the other hand, plant spacing (20cm x 10cm) and produced significantly higher grain yield (3.95 t/ha in 2017 and 4.65 t/ha in 2018). The highest grain and straw yields were recorded with the treatment of 20 cm × 10 cm plant spacing and 180 kg N/ha in 2017 and 2018 respectively.

Keywords: Nitrogen, planting geometry, rice, growth and yield

Introduction
Rice (*Oryza sativa* L.) is the foremost staple food for more than 60% of the world's population providing major source of the food energy. It is grown in 114 countries across the world on an area about 160 million hectares with annual production of 494.3 million tones, and total supply of 711.5 million tones. Globally, total rice consumption was recorded 491.5 million metric tonnes in 2014-15 (Anonymous, 2015-16). More than 90% of the world's rice is produced and consumed in Asia. It is the important crop in the country's food security accounting about 44% of the total food grain production and holds about 20% share in national agricultural GDP and provides 43% calorie requirement for more than 70% of Indians. In India rice covers highest area by a single crop and it is also maximum area among all rice growing countries. It is an important crop in India which occupied 43.9 million hectares with the annual production of 103.6 million tonnes (Ministry of Agriculture, Directorate of Economics and Statistics, 2015). It is estimated that by the year 2025, the world's farmers should produce about 60% more rice than at present to meet the food demands of the expected world population at that time and by 2035, 114 million tones additional milled rice need to produce (Kumar and Ladha, 2011) [2]. Agronomic management practices such as spacing and nitrogen application are two major factors influencing the growth and yield of rice. Optimum dose of nitrogen fertilization plays a vital role in growth and development and grain formation as a result of higher yield of rice plant. Excessive nitrogen fertilization encourages excessive vegetative growth which makes the plant susceptible to insect, pest and diseases, which ultimately reduces yield whereas less than optimum rate affects both yield and quality of rice to remarkable extent. So, it is essential to find out the optimum rate of nitrogen application for its efficient utilization by the plants for better yield. Optimum plant spacing ensures plants to grow properly both in their aerial and underground parts through utilization of solar radiation and nutrients, therefore proper manipulation of planting density may lead to increase in the economic yield of transplanted rice (Sampath *et al.*, 2017) [7]. Planting geometry determines the planting density or plant population in unit area thereby influencing the input use efficiency and yield of the crop. Plant spacing is a major non monetary input which plays a significant role in achieving greater nutrient use efficiency with higher growth and yield of the crop. Salahuddin *et al.* (2009) [6] reported that the lowest number of grains/panicle was produced under control (0 kg N/ha) irrespective of the plant spacing. Though, grain yield /ha increased with increasing level of nitrogen up to 180 kg/ha, irrespective of plant spacing. Keeping above points in mind the present investigation was carried out to assess the effect of nitrogen in transplanted rice under varying plant spacing in a sandy loam soil.

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(10): 2667-2669
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 2667-2669
© 2021 TPI
www.thepharmajournal.com
Received: 15-08-2021
Accepted: 26-09-2021

Shashank Shekher Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Pradeep Rajput
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Permendra Singh
Department of Agronomy, Advanced Center for Rainfed Agriculture, Dhiansar, SKUAST, Jammu, Jammu and Kashmir, India

Corresponding Author:
Shashank Shekher Singh
Department of Agronomy, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Effect of different planting density and nitrogen levels on growth characters and yield of rice (*Oryza sativa*) grown under eastern Uttar Pradesh

Shashank Shekher Singh, AK Singh, Pradeep Rajput and Permendra Singh

Abstract
The experimental result revealed that different planting geometry and level of nitrogen had a remarkable influence on almost all the growth characters and yield of rice. Growth characters, *viz.* plant height, number of tillers/m^2, Leaf area index, dry matter accumulation/m^2 were increased significantly with the increasing level of nitrogen from 0 to 180 kg/ha in both of year. On the other hand, plant spacing (20cm x 10cm) and produced significantly higher grain yield (3.95 t/ha in 2017 and 4.65 t/ha in 2018). The highest grain and straw yields were recorded with the treatment of 20 cm × 10 cm plant spacing and 180 kg N/ha in 2017 and 2018 respectively.

Keywords: Nitrogen, planting geometry, rice, growth and yield

Introduction
Rice (*Oryza sativa* L.) is the foremost staple food for more than 60% of the world's population providing major source of the food energy. It is grown in 114 countries across the world on an area about 160 million hectares with annual production of 494.3 million tones, and total supply of 711.5 million tones. Globally, total rice consumption was recorded 491.5 million metric tonnes in 2014-15 (Anonymous, 2015-16). More than 90% of the world's rice is produced and consumed in Asia. It is the important crop in the country's food security accounting about 44% of the total food grain production and holds about 20% share in national agricultural GDP and provides 43% calorie requirement for more than 70% of Indians. In India rice covers highest area by a single crop and it is also maximum area among all rice growing countries. It is an important crop in India which occupied 43.9 million hectares with the annual production of 103.6 million tonnes (Ministry of Agriculture, Directorate of Economics and Statistics, 2015). It is estimated that by the year 2025, the world's farmers should produce about 60% more rice than at present to meet the food demands of the expected world population at that time and by 2035, 114 million tones additional milled rice need to produce (Kumar and Ladha, 2011) [2]. Agronomic management practices such as spacing and nitrogen application are two major factors influencing the growth and yield of rice. Optimum dose of nitrogen fertilization plays a vital role in growth and development and grain formation as a result of higher yield of rice plant. Excessive nitrogen fertilization encourages excessive vegetative growth which makes the plant susceptible to insect, pest and diseases, which ultimately reduces yield whereas less than optimum rate affects both yield and quality of rice to remarkable extent. So, it is essential to find out the optimum rate of nitrogen application for its efficient utilization by the plants for better yield. Optimum plant spacing ensures plants to grow properly both in their aerial and underground parts through utilization of solar radiation and nutrients, therefore proper manipulation of planting density may lead to increase in the economic yield of transplanted rice (Sampath *et al.*, 2017) [7]. Planting geometry determines the planting density or plant population in unit area thereby influencing the input use efficiency and yield of the crop. Plant spacing is a major non monetary input which plays a significant role in achieving greater nutrient use efficiency with higher growth and yield of the crop. Salahuddin *et al.* (2009) [6] reported that the lowest number of grains/panicle was produced under control (0 kg N/ha) irrespective of the plant spacing. Though, grain yield /ha increased with increasing level of nitrogen up to 180 kg/ha, irrespective of plant spacing. Keeping above points in mind the present investigation was carried out to assess the effect of nitrogen in transplanted rice under varying plant spacing in a sandy loam soil.

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(10): 2664-2666

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 2664-2666
© 2021 TPI
www.thepharmajournal.com
Received: 15-08-2021
Accepted: 26-09-2021

Shashank Shekher Singh
Department of Agronomy, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Anil Kumar Singh
Department of Agronomy, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Permendra Singh
Department of Agronomy, Advanced Center for Rain fed Agriculture, S.K.U.A.S.T. Jammu, Jammu and Kashmir, India

Corresponding Author:
Permendra Singh
Department of Agronomy, Advanced Center for Rain fed Agriculture, S.K.U.A.S.T. Jammu, Jammu and Kashmir, India

Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) varieties under Indo-gangetic plains of Awadh area

Shashank Shekher Singh, Anil Kumar Singh and Permendra Singh

Abstract
The field experiment entitled "Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) varieties" was conducted at Agronomy Research Farm of Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh during *Kharif* season of 2015 with an objective to find out suitable date of transplanting of rice, the treatment consisted of three transplanting date (15 July, 25 July and 5 August) and three varieties (Sarju-52, NDR-359 and Swarna) there were 9 treatment combinations.

The values of growth contributing characters *viz.* plant height (cm), number of tillers, dry matter accumulation, leaf area index and yield attributes like number of panicles m^{-2}, length of panicle (cm), number of $panicle^{-1}$, grain weight $panicle^{-1}$, grain and straw yield (q ha^{-1}) were increasing significantly with 15 July date of transplanting followed by 25 July date of transplanting and significantly superior with 5 August date of transplanting. In case of variety the performance the growth characters like plant height (cm), number of $tillers m^{-2}$, dry matter accumulation (g m^2) leaf area index and yield attributes like number of panicles m^{-2}, length of panicle (cm), number of $panicle^{-1}$, grain weight $panicle^{-1}$, grain and straw yield (q ha^{-1}). Swarna recorded higher yield and yield attribute which was at par with NDR-359 and significant over Sarju-52.

Keywords: Transplanting, *Oryza sativa*, indo-gangetic, Awadh area

Introduction

Rice (*Oryza sativa* L.) is one of the most important cereal crops of *kharif* season. Rice is cultivated world-wide over an area of about 160.68 million ha^{-1} with an annual production of about 650.19 million tonnes. In India it is cultivated over an area of about 39.16 million hectares with an annual production of about 85.59 million tonnes and the productivity of 2.20 tonnes ha^{-1}. Uttar Pradesh is an important rice growing state in the country. The area and production of rice in U.P. is about 13.84 million hectare and 14.00 million tonnes respectively with an average production of 2.35 tonnes (Anonymous, 2013) [1-4]. Production of rice rank second among the food grain and half of the world population receiving the highest (26.2%) calories intake from it in the developing countries of their dietary protein (FAO, 2009) [6]. Rice is an excellent source of carbohydrate and to a certain extent it provides protein to regular human diet. So it is used as staple food crop by about half of the world population and eaten as cooked rice and also used for various preparations inhabiting in the humid tropics and subtropics. Further, rice has commercial and industrial importance also beside grains. Rice straw and rice hulls are used as fodder, mulching, packing and as insulation material etc.

Globally rice is grown on 153 mha (FAO, 2006) [5]. Though its production and consumption is concentrated in Asia, where more than 90% of rice is consumed. India produced 103.41 million tones during 2011-12 from 44.07 million hectares with average productivity of 2270.75 kg/ha. Dry matter accumulation in leaves decreased in test cultivars (PR-106, PR-109 and Basmati-370) with later transplanting dates. Delayed transplanting reduced seedling dry matter in PR-106 and PR-109, but an increase was observed in Basmati-370 with least accumulation of dry matter in leaves.

Different varieties respond variably under different date of transplanting. In view of above facts, the present investigation entitled, "Effect of different date of transplanting on growth and yield of rice (*Oryza sativa* L.) Varieties" was conducted during kharif 2015 with the

The Pharma Innovation Journal 2021; 10(10): 2207-2211

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 2207-2211
© 2021 TPI
www.thepharmajournal.com
Received: 13-08-2021
Accepted: 17-09-2021

Bhayankar
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professor & Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Ankit Gupta
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Ambikesh Tripathi
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Hariom Mishra
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Bhayankar
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

To find out the suitable irrigation scheduling of transplanted rice, to assess the growth and yield of various treatments

Bhayankar, Anil Kumar Singh, Hariom Mishra, Ambikesh Tripathi and Ankit Gupta

Abstract
The present investigation entitled "To find out the suitable irrigation scheduling of transplanted rice, to assess the growth and yield of various treatments." A field experiment was conducted at Agronomy Research Farm of, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *Kharif* season of 2020-21. The experiment was laid out in Randomized block design with four replications and eight treatments viz. One Irrigation at tillering, Two Irrigation at tillering + PI stage, Three Irrigation at tillering + PI + Flowering stage, Four Irrigation at tillering + PI + Flowering + milking stage, Two Irrigation at tillering + milking stage, Two Irrigation at PI + milking stage, Five Irrigation at tillering + PI + Flowering + milking + dough stage, No Irrigation. Results revealed that irrigation scheduling among treatments application Five Irrigation at tillering + PI + Flowering +milking +dough stage proved superior to other treatments with respect to higher crop growth, yield and yield attributes.

Keywords: Irrigation scheduling

Introduction
Rice (*Oryza sativa* L.) is one of the most important cereal crops belongs to Poaceae (Gramineae) family, diverse ecosystem of rice cultivated in India. It is most important staple food of about more than 65% of total world population. Rice occupies a pivotal role in Indian agriculture and it is staple food for more than 70% of population and a source of a livelihood for about 120-150 million rural households. It accounts for about 43% of total food grain production and 55% of total cereal production in the country. Rice is grown on over 158.7 million hectares around the world, with an annual production of about 700. Million tonnes and average productivity 4.19 tonnes per hectares. The Asian region produces and consumes about 90% of all rice formed worldwide. It is grown on 43.78 million hectare in India, producing 115.60 million tonnes with an average productivity of 25.78 q ha^{-1} (Anonymous, 2018).
Uttar Pradesh is the largest rice growing state after west Bengal where rice is grown in 5.81 million hectare with annual production of 13.27 million tonnes and average productivity of UP is 22.83 q ha^{-1} which is considered low as compared to productivity of Punjab 43.66 q ha^{-1}, Haryana 31.81 q ha^{-1} and West Bengal 29.26 q ha^{-1} (Anonymous, 2018). Transplanting at the right time may be one of the agronomic strategies maximizing a crops maximum potential and photoperiod sensitivity, resulting in higher yield and better grain quality. Delay in seeding causes poor emergence worse yield attributes, and ultimately lower yields. Manual transplanting require a lot of labors and also very expensive. Scarcity of labors in another major problem in some paddy growing areas of the countries. Rice has substantially lower water consumption efficiency than other crops. (Bouman 2009) [1]. actices such as improved irrigation management (Bouman and Tuong, 2001) [2] Earlier rice crop was transplanted in may under maximum temperature of 39-42 C, which increased the irrigation water requirement of crop to the tune of 180-240 cm per season (Brar, *et al*. 2012) [3]. Yield may decline under this practice, but water saving and water productivity increases. These previous studies focused on the applied amount of irrigation water without much attention in matching rain occurrence with the crop high needed water stage. Basically the main target was to keep daily soil moisture at saturation level and irrigation frequently stopped when rain occurred. However, high water productivity can not be achieved in irrigation regardless of rainfall occurrence opportunities at specific growth stage, specially for an area like Taiwan where

The Pharma Innovation Journal 2021; 10(9): 2204-2206

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 2204-2206
© 2021 TPI
www.thepharmajournal.com
Received: 08-07-2021
Accepted: 18-08-2021

Shashank Shekher Singh
Department of Agronomy, ANDUAT, Ayodhya, Uttar Pradesh, India

Permendra Singh
Department of Agronomy, Advanced Centre for Rainfed Agriculture, Dhansar, SKUAST, Jammu and Kashmir, India

Ashutosh Pratap Singh
Department of Agronomy, ANDUAT, Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Department of Agronomy, ANDUAT, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shashank Shekher Singh
Department of Agronomy, ANDUAT, Ayodhya, Uttar Pradesh, India

The economic feasibility of various treatment combinations of rice (*Oryza sativa* L.)

Shashank Shekher Singh, Permendra Singh, Ashutosh Pratap Singh and Anil Kumar Singh

Abstract
A field experiment was conducted on the topic entitled "The economic feasibility of various treatment combinations of rice (*Oryza sativa* L.)" during two consecutive *kharif* seasons of 2017 and 2018 at Agronomy Research Farm, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.) Experiment was comprised with sixteen treatment combinations *viz.* four planting geometry and four nitrogen levels in split plot design. Four planting geometry i.e. 15x10 cm, 15x15 cm, 20x10 cm and 20x15 cm were kept in main plots and four nitrogen levels i.e. 0 kg N/ha, 60 kg/N ha, 120 kg N/ha and 180 kg/N ha were kept in sub plots. The experiment was replicated three times. Results reveal that application of 120 kg N/ha applied in 20cm×10cm planting geometry recorded highest gross nutrient Rs. 102140/ha; net return Rs. 68415/ha and highest net return per rupees invested 2.02.

Keywords: Geometry, return, gross, economic

Introduction

Rice (*Oryza sativa* L.) is the foremost staple food for more than 60% of the world's population providing major source of the food energy. It is grown in 114 countries across the world on an area about 160 million hectares with annual production of 494.3 million tonnes, and total supply of 711.5 million tonnes (Anonymous, 2015-16) [1]. Globally, total rice consumption was recorded 491.5 million metric tonnes in 2014-15 (Anonymous, 2015-16) [1]. More than 90% of the world's rice is produced and consumed in Asia. It is the important crop in the country's food security accounting about 44% of the total food grain production and holds about 20% share in national agricultural GDP and provides 43% calorie requirement for more than 70% of Indians. In India rice covers highest area by a single crop and it is also maximum area among all rice growing countries. It is an important crop in India which occupied 43.9 million hectares with the annual production of 103.6 million tonnes (Ministry of Agriculture, Directorate of Economics and Statistics, 2015). It is estimated that by the year 2025, the world's farmers should produce about 60% more rice than at present to meet the food demands of the expected world population at that time and by 2035, 114 million tones additional milled rice need to produce.

Rice farming in the state is most vulnerable and risk prone due to complex ecological situations marked by frequent flood or drought or both. It is clear that yield is stagnating around ≤ 2.0 t q/ha since 2001-2002 except in the year 2002-2003, 2004-2005 and 2009- 2010 due to erratic rainfall distribution causes excess water stagnation/ drought or both in different years. Rice is grown in all the districts of Uttar Pradesh with low to high acreage. It is part of the nearly every meal and it is grown on a majority of the rural farms. Uttar Pradesh is the leading producer of rice and rank 3rd in the country. Annual rice production is around 12 metric ton in state. It is cultivated mainly in Kharif season (wet season) in around 5.90 million hectares followed by Zaid (summer season) 35000-40000 hectare only. As regards the Boro rice, it is grown in only deeply flooded areas around 3000 ha or so mainly in the eastern districts of the Uttar Pradesh. The average productivity of the state is around 2 t/ha (Ministry of Agriculture, Directorate of Economics and Statistics, 2015). There are three rice growing seasons in the state. These are wet season (*Kharif*), winter season (Boro) and *Summer* season (Zaid). The growing period of rice in difference seasons are *Kharif* – June – July to October-November; Boro – October- November to April – May and *Zaid* – February to May- June. *Kharif* is the main rice growing season in the state and more than 98% rice (around 5.9 mha) is cultivated during kharif season covering early, medium and long duration varieties.

The Pharma Innovation Journal 2021; 10(10): 2207-2211

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 2207-2211
© 2021 TPI
www.thepharmajournal.com
Received: 13-08-2021
Accepted: 17-09-2021

Bhayankar
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Associate Professor & Head, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya. Uttar Pradesh, India

Ankit Gupta
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Ambikesh Tripathi
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya. Uttar Pradesh, India

Hariom Mishra
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author
Bhayankar
M. Sc. Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture

To find out the suitable irrigation scheduling of transplanted rice, to assess the growth and yield of various treatments

Bhayankar, Anil Kumar Singh, Hariom Mishra, Ambikesh Tripathi and Ankit Gupta

Abstract
The present investigation entitled "To find out the suitable irrigation scheduling of transplanted rice, to assess the growth and yield of various treatments." A field experiment was conducted at Agronomy Research Farm of, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *Kharif* season of 2020-21. The experiment was laid out in Randomized block design with four replications and eight treatments viz. One Irrigation at tillering, Two Irrigation at tillering + PI stage, Three Irrigation at tillering + PI + Flowering stage, Four Irrigation at tillering + PI + Flowering + milking stage, Two Irrigation at tillering + milking stage, Two Irrigation at PI + milking stage, Five Irrigation at tillering + PI + Flowering + milking + dough stage, No Irrigation. Results revealed that irrigation scheduling among treatments application Five Irrigation at tillering + PI + Flowering +milking +dough stage proved superior to other treatments with respect to higher crop growth, yield and yield attributes.

Keywords: Irrigation scheduling

Introduction

Rice (*Oryza sativa* L.) is one of the most important cereal crops belongs to Poaceae (Gramineae) family, diverse ecosystem of rice cultivated in India. It is most important staple food of about more than 65% of total world population. Rice occupies a pivotal role in Indian agriculture and it is staple food for more than 70% of population and a source of a livelihood for about 120-150 million rural households. It accounts for about 43% of total food grain production and 55% of total cereal production in the country. Rice is grown on over 158.7 million hectares around the world, with an annual production of about 700. Million tonnes and average productivity 4.19 tonnes per hectares. The Asian region produces and consumes about 90% of all rice formed worldwide. It is grown on 43.78 million hectare in India, producing 115.60 million tonnes with an average productivity of 25.78 q ha^{-1} (Anonymous, 2018). Uttar Pradesh is the largest rice growing state after west Bengal where rice is grown in 5.81 million hectare with annual production of 13.27 million tonnes and average productivity of UP is 22.83 q ha^{-1} which is considered low as compared to productivity of Punjab 43.66 q ha^{-1}, Haryana 31.81 q ha^{-1} and West Bengal 29.26 q ha^{-1} (Anonymous, 2018). Transplanting at the right time may be one of the agronomic strategies maximizing a crops maximum potential and photoperiod sensitivity, resulting in higher yield and better grain quality. Delay in seeding causes poor emergence worse yield attributes, and ultimately lower yields. Manual transplanting require a lot of labors and also very expensive. Scarcity of labors in another major problem in some paddy growing areas of the countries. Rice has substantially lower water consumption efficiency than other crops. (Bouman 2009) [1]. actices such as improved irrigation management (Bouman and Tuong, 2001) [2] Earlier rice crop was transplanted in may under maximum temperature of 39-42 C, which increased the irrigation water requirement of crop to the tune of 180-240 cm per season (Brar, *et al.* 2012) [3]. Yield may decline under this practice, but water saving and water productivity increases. These previous studies focused on the applied amount of irrigation water without much attention in matching rain occurrence with the crop high needed water stage. Basically the main target was to keep daily soil moisture at saturation level and irrigation frequently stopped when rain occurred. However, high water productivity can not be achieved in irrigation regardless of rainfall

The Pharma Innovation Journal 2021; 10(8): 472-475

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(8): 472-475
© 2021 TPI
www.thepharmajournal.com
Received: 02-06-2021
Accepted: 10-07-2021

Chandra Shekhar
Department of Agronomy, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Vishuddha Nand
Department of Agronomy, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Anil Kumar Singh
Department of Agronomy, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Navaneet Kumar
Department of Soil Science and Agricultural Chemistry, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Deepak Kumar
Department of Soil Science and Agricultural Chemistry, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Satyaveer Singh
Department of Agronomy, CSAUA & T Kanpur, Uttar Pradesh, India

Corresponding Author:
Chandra Shekhar
Department of Agronomy, ANDUA & T Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of integrated nutrient management (INM) on growth parameters of timely sown wheat (*Triticum aestivum* L.)

Chandra Shekhar, Vishuddha Nand, Anil Kumar Singh, Navaneet Kumar, Deepak Kumar and Satyaveer Singh

Abstract
An experiment was conducted during *rabi* season of 2018-19 and 2019-20 at Agronomy Research Farm, ANDUA&T Kumarganj, Ayodhya (U.P.) India. The experiment consists of fourteen treatments were laid out in Randomized Block Design (RBD) with three replications. As per experiment the results revealed that the growth parameters were significantly influenced by different integrated nutrient management at successive growth stages of crop except 30 DAS. Crop growth rate increased progressively with increase in duration of wheat crop. Crop growth rate was maximum up to 90 DAS and thereafter, a slow increase in growth was obtained up to harvest. Among the integrated nutrient management, 75% RDN+25% N through (poultry manure) + ZnSO4 @ 25 kg ha^{-1} + Sulphur @ 40 kg ha^{-1} proved to found better as regarding of plant height (83.90, 95.90 cm), dry matter accumulation (1073.50, 1111.00 g m^{-2}) and number tillers per (334.66, 341.36 m^{-2}) at harvest stage in respective years. Whereas leaf area index was measured maximum at 60 DAS after than it declined. The minimum growth parameters were observed under control.

Keywords: Growth, wheat, plant height, dry matter, LAI and tillers

Introduction
Wheat (*Triticum aestivum* L.) being a major cereal crop cultivated in India and abroad. It belongs to Poaceae family. Wheat generally grown in *rabi* season and it can be successful grown in the tropical and sub-tropical climates and also in the temperate zone. Wheat can tolerate to severe cold and snow and resume growth with the setting in warm weather in spring. It can be cultivated from sea level to an altitude of 3300 meters. The most favorable climatic condition for wheat cultivation is cool and moist weather during the vegetative growth period followed by dry, warm weather for the grain to mature and ripening. The optimum temperature range for ideal germination of wheat seed is 20-25 ^{0}C. Warm and dry climatic conditions are not suited for wheat during the heading and flowering stage, excessively high or low temperatures and drought are harmful to wheat. Cloudy weather with high humidity and low temperatures is conducive for rust attack. It requires about 25-30^{0}C optimum average temperature at the time of ripening. The temperature at the time of grain filling and development are very crucial for yield. Temperatures above 25^{0}C tend to depress grain weight. Wheat contains more protein in the form of gluten than other cereals crop. Wheat occupied an acreages about 215.29 million ha with production of 730.84 million metric tonns with productivity of 3390 kg ha^{-1} (Anonymous, 2019) [2]. In India it is grown on 29.55 million ha^{-1} (13.43% global area) with the production of 101.20 million tonns (1.3% rises previous year) and productivity about 3424 kg ha^{-1} (Anonymous, 2019) [2]. In Uttar Pradesh wheat occupied about 9.78 million ha^{-1} achieved rank first in production (31.99 million tonns) with productivity (3269 kg ha^{-1}). But the productivity is comparatively lower than that the Punjab (5030 kg ha^{-1}) and Haryana (4410 kg ha^{-1}).

Present time adoption of intensive cropping system will meet the food as per the demands of increasing population, it requires high input energy, which are not only responsible for environment degradation but also increased the cost of cultivation. After the green revolution, production of crops has increased to a great extent due to the use of chemical fertilizers but their indiscriminate use has led to soil sickness, ecological hazards and depletion of other sources of energy. The recent energy crisis, high fertilizer cost and low purchasing power of the farming community have made it necessary to re-think alternatives.

The Pharma Innovation Journal 2022; 11(3): 2399-2403

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 2399-2403
© 2022 TPI
www.thepharmajournal.com
Received: 06-12-2021
Accepted: 09-01-2022

Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ravi Verma
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shivanand Maurya
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Response of Indian mustard (*Brassica juncea* L.) to source and levels of sulphur on oil content and nutrient uptake

Shrimannarayan Dubey, AK Singh, Ravi Verma and Shivanand Maurya

Abstract
The present investigation entitled "Response of Indian mustard (*Brassica Juncea* L.) to sources and levels of sulphur on oil content and nutrient uptake." was carried out during *Rabi* season of 2018 and 2019 at Agronomy Research Farm of the A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The 36 treatment combinations having three sulphur sources *viz.* Phosphogypsum, Elemental Sulphur and Single Super Phosphate were investigated with four levels of sulphur *viz.* 0.00 kg ha^{-1}, 20 kg ha^{-1}, 40 kg ha^{-1} and 60 kg ha^{-1} was kept in different plots. The experiment in F-RBD and replicated in three times. The total Nitrogen, Phosphorus, Potassium and Sulphur uptake by crop was highest recorded 106.55, 36.93, 150.63 and 20.93 kg ha^{-1} respectively with phosphogypsum source of sulphur significantly as compared to rest two sources of sulphur in seed, stover and crop during both the years of experimentation. As far as doses of sulphur was concerned, Nitrogen, Phosphorus, Potassium and Sulphur uptake increased with simultaneous increase in S doses resulting maximum value at 60 kg Sulphur ha^{-1}(108.17, 37.50, 152.73 and 21.93 kg ha^{-1} respectively) which exhibited significance over rest of sulphur doses. The trend of increase was similar in uptake by seed, stover and crop during both the years of study. The highest oil content 38.57% and 38.81% in seed was noted during first and second year respectively from phosphogypsum source of sulphur and level of sulphur is 60 kg Sulphur ha-1 which exhibited statistical similarity with rest sources of sulphur and level of sulphur.

Keywords: Indian mustard, oil content, nutrient uptake

Introduction
Indian mustard (*Brassica juncea* L.) is locally called Rai, Raya, Laha and Raiya, whereas, rapeseed is called Sarson, Toria, yellow Toria. Its green tender plants are used for preparing vegetable dish commonly called as "Sarson Ka Saag". The oil is utilized for human consumption throughout northern India for cooking and frying purposes. The whole seed is used as condiment in the preparation of pickles and for flavoring curries and vegetables. The mustard oil is also used in preparing vegetable ghee, hair oil, medicines, soaps, lubricating oil and in tanning industries. The oil content in mustard seeds varies from 37-49 per cent (Bhowmik *et al.,* 2014) [2]. The seeds are highly nutritive containing 38-57% erucic acid, 5-13% linolic acid and 27% oleic acid.

Oilseed crops occupy an important place in Indian agricultural economy as well as in human life. They are not only rich sources of energy and carriers of fat soluble vitamins A, D, E and K but they form the ingredients of foods and flavors; cosmetics and condiments; soap and detergents; lubricants and laxatives and also known for their medical and therapeutic use. Rapeseed-mustard is the third most important edible oilseed crop in India having 30 to 48 per cent oil content after soybean and groundnut.

Mustard seed has content 28 to 36% protein with a high nutritive value. Mustard is one of the major sources of oil in India. Indian mustard (*Brassica juncea* L.) is the most important *rabi* season oilseed crop, which thrives best in light to heavy loam soil in areas having 25 to 40 cm rainfall. Mustard oil is mainly used for cooking, frying and in pickles. The oil cake left after extraction is utilized as cattle feed and manure. Its oil cake contains 5.2, 1.8 and 1.2 per cent N, P and K, respectively.

Sulphur is the fourth major plant nutrient after nitrogen, phosphorus and potassium for Indian agriculture. It is essential for synthesis of amino acids, proteins, oils, and a component of vitamin A and activates enzyme system in plant. Three amino acids *viz.* methionine (21% S), cysteine (26% S) and cystine (27%S) contain S which are the building blocks of proteins about 90% of sulphur is present in these amino acids.

The Pharma Innovation Journal 2022; 11(3): 2399-2403

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 2399-2403
© 2022 TPI
www.thepharmajournal.com
Received: 06-12-2021
Accepted: 09-01-2022

Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ravi Verma
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shivanand Maurya
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Response of Indian mustard (*Brassica juncea* L.) to source and levels of sulphur on oil content and nutrient uptake

Shrimannarayan Dubey, AK Singh, Ravi Verma and Shivanand Maurya

Abstract
The present investigation entitled "Response of Indian mustard (*Brassica Juncea* L.) to sources and levels of sulphur on oil content and nutrient uptake." was carried out during *Rabi* season of 2018 and 2019 at Agronomy Research Farm of the A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The 36 treatment combinations having three sulphur sources *viz.* Phosphogypsum, Elemental Sulphur and Single Super Phosphate were investigated with four levels of sulphur *viz.* 0.00 kg ha^{-1}, 20 kg ha^{-1}, 40 kg ha^{-1} and 60 kg ha^{-1} was kept in different plots. The experiment in F-RBD and replicated in three times. The total Nitrogen, Phosphorus, Potassium and Sulphur uptake by crop was highest recorded 106.55, 36.93, 150.63 and 20.93 kg ha^{-1} respectively with phosphogypsum source of sulphur significantly as compared to rest two sources of sulphur in seed, stover and crop during both the years of experimentation. As far as doses of sulphur was concerned, Nitrogen, Phosphorus, Potassium and Sulphur uptake increased with simultaneous increase in S doses resulting maximum value at 60 kg Sulphur ha^{-1}(108.17, 37.50, 152.73 and 21.93 kg ha^{-1} respectively) which exhibited significance over rest of sulphur doses. The trend of increase was similar in uptake by seed, stover and crop during both the years of study. The highest oil content 38.57% and 38.81% in seed was noted during first and second year respectively from phosphogypsum source of sulphur and level of sulphur is 60 kg Sulphur ha-1 which exhibited statistical similarity with rest sources of sulphur and level of sulphur.

Keywords: Indian mustard, oil content, nutrient uptake

Introduction
Indian mustard (*Brassica juncea* L.) is locally called Rai, Raya, Laha and Raiya, whereas, rapeseed is called Sarson, Toria, yellow Toria. Its green tender plants are used for preparing vegetable dish commonly called as "Sarson Ka Saag". The oil is utilized for human consumption throughout northern India for cooking and frying purposes. The whole seed is used as condiment in the preparation of pickles and for flavoring curries and vegetables. The mustard oil is also used in preparing vegetable ghee, hair oil, medicines, soaps, lubricating oil and in tanning industries. The oil content in mustard seeds varies from 37-49 per cent (Bhowmik *et al.*, 2014) [2]. The seeds are highly nutritive containing 38-57% erucic acid, 5-13% linolic acid and 27% oleic acid.

Oilseed crops occupy an important place in Indian agricultural economy as well as in human life. They are not only rich sources of energy and carriers of fat soluble vitamins A, D, E and K but they form the ingredients of foods and flavors; cosmetics and condiments; soap and detergents; lubricants and laxatives and also known for their medical and therapeutic use. Rapeseed-mustard is the third most important edible oilseed crop in India having 30 to 48 per cent oil content after soybean and groundnut.

Mustard seed has content 28 to 36% protein with a high nutritive value. Mustard is one of the major sources of oil in India. Indian mustard (*Brassica juncea* L.) is the most important *rabi* season oilseed crop, which thrives best in light to heavy loam soil in areas having 25 to 40 cm rainfall. Mustard oil is mainly used for cooking, frying and in pickles. The oil cake left after extraction is utilized as cattle feed and manure. Its oil cake contains 5.2, 1.8 and 1.2 per cent N, P and K, respectively.

Sulphur is the fourth major plant nutrient after nitrogen, phosphorus and potassium for Indian agriculture. It is essential for synthesis of amino acids, proteins, oils, and a component of vitamin A and activates enzyme system in plant. Three amino acids *viz.* methionine (21% S), cysteine (26% S) and cystine (27%S) contain S which are the building blocks of proteins about 90% of sulphur is present in these amino acids.

The Pharma Innovation Journal 2022; 11(1): 1368-1373

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(1): 1368-1373
© 2022 TPI
www.thepharmajournal.com
Received: 10-11-2021
Accepted: 22-12-2021

Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Ravi Verma
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Shivanand Maurya
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Response of Indian mustard (*Brassica juncea* L.) to sources and levels of sulphur on growth, yield and yield attributes

Shrimannarayan Dubey, AK Singh, Ravi Verma and Shivanand Maurya

Abstract
The present investigation entitled "Response of Indian Mustard (*Brassica juncea* L.) to sources and levels of sulphur on growth, yield and yield attributes." was carried out during *Rabi* season of 2018 and 2019 at Agronomy Research Farm of the A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The 36 treatment combinations having three sulphur sources *viz.* Phosphogypsum, Elemental Sulphur and Single Super Phosphate were investigated with four levels of sulphur *viz.* 0.00 kg ha^{-1}, 20 kg ha^{-1}, 40 kg ha^{-1} and 60 kg ha^{-1} was kept in different plots. The experiment in F-RBD and replicated in three times. The Dry matter accumulation, Leaf area index, number of siliqua $plant^{-1}$, Length of siliqua (cm), Number of seed $siliqua^{-1}$, 1000 grain weight, Seed yield (q ha^{-1}), Stover yield (q ha^{-1}) and Harvest index reported optimum with Phosphogypsum and sulphur level is 60 kg ha^{-1}.

Keywords: Indian mustard, leaf area index, harvest index

Introduction
Indian mustard (*Brassica juncea* L.) is locally called Rai, Raya, Laha and Raiya, whereas, rapeseed is called Sarson, Toria, yellow Toria. Its green tender plants are used for preparing vegetable dish commonly called as "Sarson Ka Saag". The oil is utilized for human consumption throughout northern India for cooking and frying purposes. The whole seed is used as condiment in the preparation of pickles and for flavouring curries and vegetables. The mustard oil is also used in preparing vegetable ghee, hair oil, medicines, soaps, lubricating oil and in tanning industries. The oil content in mustard seeds varies from 37-49 per cent (Bhowmik *et al.*, 2014) [2]. The seeds are highly nutritive containing 38-57% erucic acid, 5-13% linolic acid and 27% oleic acid.

Rapeseed-mustard (*Brassica spp.*) is a major group of oilseed crops of the world with second largest acreage in India after China. Rapeseed-mustard contributed 24.5% in total oilseed production in the country. Indian mustard is preferred due to its high yield potential and oil content. Indian mustard has multiple uses as a spice or condiment in preparation, seasoning and stuffing of several foods and pickles in India. Yield potential of this crop can be explored by the use of agronomic-techniques. Among them, time of sowing is an important non monetary input. Variation in the sowing date, day length and temperature interact to influence growth, yield and quality of a crop. The optimum time of sowing can provide congenial conditions to have maximum light interception, best utilization of moisture and nutrients from early growth stage to seed filling stage. Sowing time is very important for mustard production. It is responsive to plant nutrient, especially nitrogen. Nitrogen is considered to be the most important nutrients for the crop to activate the metabolic activity and transformation of energy, chlorophyll and protein synthesis. Nitrogen also affects uptake of other essential nutrients and it helps in the better partitioning of photosynthetic to reproductive parts which increases the seed: stover ratio.

Sulphur occurs in soils mainly organic forms along with smaller amounts of inorganic forms (SO_4^{2-}) before it is used by the plant. Microbial mineralization of sulphur in soil is affected by various factors including moisture content, pH, temperature and soil aeration. Chemical fertilizers being used for supplementing the major nutrients are generally either deficient or low in sulphur content. Thus, the use of high analysis sulphur fertilizers can provide an impetus to oilseed production in the country. High analysis sulphur containing material may be gypsum, elemental sulphur and single super phosphate etc. which could be quite useful in augmenting the mustard production. Gypsum are generally used as soil amendments in salt

The Pharma Innovation Journal 2022; 11(3): 2399-2403

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 2399-2403
© 2022 TPI
www.thepharmajournal.com
Received: 06-12-2021
Accepted: 09-01-2022

Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ravi Verma
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shivanand Maurya
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Response of Indian mustard (*Brassica juncea* L.) to source and levels of sulphur on oil content and nutrient uptake

Shrimannarayan Dubey, AK Singh, Ravi Verma and Shivanand Maurya

Abstract
The present investigation entitled "Response of Indian mustard (*Brassica Juncea* L.) to sources and levels of sulphur on oil content and nutrient uptake." was carried out during *Rabi* season of 2018 and 2019 at Agronomy Research Farm of the A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The 36 treatment combinations having three sulphur sources *viz.* Phosphogypsum, Elemental Sulphur and Single Super Phosphate were investigated with four levels of sulphur *viz.* 0.00 kg ha^{-1}, 20 kg ha^{-1}, 40 kg ha^{-1} and 60 kg ha^{-1} was kept in different plots. The experiment in F-RBD and replicated in three times. The total Nitrogen, Phosphorus, Potassium and Sulphur uptake by crop was highest recorded 106.55, 36.93, 150.63 and 20.93 kg ha^{-1} respectively with phosphogypsum source of sulphur significantly as compared to rest two sources of sulphur in seed, stover and crop during both the years of experimentation. As far as doses of sulphur was concerned, Nitrogen, Phosphorus, Potassium and Sulphur uptake increased with simultaneous increase in S doses resulting maximum value at 60 kg Sulphur ha^{-1}(108.17, 37.50, 152.73 and 21.93 kg ha^{-1} respectively) which exhibited significance over rest of sulphur doses. The trend of increase was similar in uptake by seed, stover and crop during both the years of study. The highest oil content 38.57% and 38.81% in seed was noted during first and second year respectively from phosphogypsum source of sulphur and level of sulphur is 60 kg Sulphur ha-1 which exhibited statistical similarity with rest sources of sulphur and level of sulphur.

Keywords: Indian mustard, oil content, nutrient uptake

Introduction
Indian mustard (*Brassica juncea* L.) is locally called Rai, Raya, Laha and Raiya, whereas, rapeseed is called Sarson, Toria, yellow Toria. Its green tender plants are used for preparing vegetable dish commonly called as "Sarson Ka Saag". The oil is utilized for human consumption throughout northern India for cooking and frying purposes. The whole seed is used as condiment in the preparation of pickles and for flavoring curries and vegetables. The mustard oil is also used in preparing vegetable ghee, hair oil, medicines, soaps, lubricating oil and in tanning industries. The oil content in mustard seeds varies from 37-49 per cent (Bhowmik *et al.,* 2014) [2]. The seeds are highly nutritive containing 38-57% erucic acid, 5-13% linolic acid and 27% oleic acid.

Oilseed crops occupy an important place in Indian agricultural economy as well as in human life. They are not only rich sources of energy and carriers of fat soluble vitamins A, D, E and K but they form the ingredients of foods and flavors; cosmetics and condiments; soap and detergents; lubricants and laxatives and also known for their medical and therapeutic use. Rapeseed-mustard is the third most important edible oilseed crop in India having 30 to 48 per cent oil content after soybean and groundnut.

Mustard seed has content 28 to 36% protein with a high nutritive value. Mustard is one of the major sources of oil in India. Indian mustard (*Brassica juncea* L.) is the most important *rabi* season oilseed crop, which thrives best in light to heavy loam soil in areas having 25 to 40 cm rainfall. Mustard oil is mainly used for cooking, frying and in pickles. The oil cake left after extraction is utilized as cattle feed and manure. Its oil cake contains 5.2, 1.8 and 1.2 per cent N, P and K, respectively.

Sulphur is the fourth major plant nutrient after nitrogen, phosphorus and potassium for Indian agriculture. It is essential for synthesis of amino acids, proteins, oils, and a component of vitamin A and activates enzyme system in plant. Three amino acids *viz.* methionine (21% S), cysteine (26% S) and cystine (27%S) contain S which are the building blocks of proteins about 90% of sulphur is present in these amino acids.

The Pharma Innovation Journal 2022; 11(3): 2399-2403

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 2399-2403
© 2022 TPI
www.thepharmajournal.com
Received: 06-12-2021
Accepted: 09-01-2022

Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Associate Professor, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ravi Verma
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shivanand Maurya
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Shrimannarayan Dubey
Ph.D., Scholar, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Response of Indian mustard (*Brassica juncea* L.) to source and levels of sulphur on oil content and nutrient uptake

Shrimannarayan Dubey, AK Singh, Ravi Verma and Shivanand Maurya

Abstract
The present investigation entitled "Response of Indian mustard (*Brassica Juncea* L.) to sources and levels of sulphur on oil content and nutrient uptake." was carried out during *Rabi* season of 2018 and 2019 at Agronomy Research Farm of the A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The 36 treatment combinations having three sulphur sources *viz*. Phosphogypsum, Elemental Sulphur and Single Super Phosphate were investigated with four levels of sulphur *viz*. 0.00 kg ha^{-1}, 20 kg ha^{-1}, 40 kg ha^{-1} and 60 kg ha^{-1} was kept in different plots. The experiment in F-RBD and replicated in three times. The total Nitrogen, Phosphorus, Potassium and Sulphur uptake by crop was highest recorded 106.55, 36.93, 150.63 and 20.93 kg ha^{-1} respectively with phosphogypsum source of sulphur significantly as compared to rest two sources of sulphur in seed, stover and crop during both the years of experimentation. As far as doses of sulphur was concerned, Nitrogen, Phosphorus, Potassium and Sulphur uptake increased with simultaneous increase in S doses resulting maximum value at 60 kg Sulphur ha^{-1}(108.17, 37.50, 152.73 and 21.93 kg ha^{-1} respectively) which exhibited significance over rest of sulphur doses. The trend of increase was similar in uptake by seed, stover and crop during both the years of study. The highest oil content 38.57% and 38.81% in seed was noted during first and second year respectively from phosphogypsum source of sulphur and level of sulphur is 60 kg Sulphur ha-1 which exhibited statistical similarity with rest sources of sulphur and level of sulphur.

Keywords: Indian mustard, oil content, nutrient uptake

Introduction
Indian mustard (*Brassica juncea* L.) is locally called Rai, Raya, Laha and Raiya, whereas, rapeseed is called Sarson, Toria, yellow Toria. Its green tender plants are used for preparing vegetable dish commonly called as "Sarson Ka Saag". The oil is utilized for human consumption throughout northern India for cooking and frying purposes. The whole seed is used as condiment in the preparation of pickles and for flavoring curries and vegetables. The mustard oil is also used in preparing vegetable ghee, hair oil, medicines, soaps, lubricating oil and in tanning industries. The oil content in mustard seeds varies from 37-49 per cent (Bhowmik *et al.*, 2014) [2]. The seeds are highly nutritive containing 38-57% erucic acid, 5-13% linolic acid and 27% oleic acid.

Oilseed crops occupy an important place in Indian agricultural economy as well as in human life. They are not only rich sources of energy and carriers of fat soluble vitamins A, D, E and K but they form the ingredients of foods and flavors; cosmetics and condiments; soap and detergents; lubricants and laxatives and also known for their medical and therapeutic use. Rapeseed-mustard is the third most important edible oilseed crop in India having 30 to 48 per cent oil content after soybean and groundnut.

Mustard seed has content 28 to 36% protein with a high nutritive value. Mustard is one of the major sources of oil in India. Indian mustard (*Brassica juncea* L.) is the most important *rabi* season oilseed crop, which thrives best in light to heavy loam soil in areas having 25 to 40 cm rainfall. Mustard oil is mainly used for cooking, frying and in pickles. The oil cake left after extraction is utilized as cattle feed and manure. Its oil cake contains 5.2, 1.8 and 1.2 per cent N, P and K, respectively.

Sulphur is the fourth major plant nutrient after nitrogen, phosphorus and potassium for Indian agriculture. It is essential for synthesis of amino acids, proteins, oils, and a component of vitamin A and activates enzyme system in plant. Three amino acids *viz*. methionine (21% S), cysteine (26% S) and cystine (27%S) contain S which are the building blocks of proteins about 90% of sulphur is present in these amino acids.

International Journal of Environment and Climate Change

12(3): 51-57, 2022; Article no.IJECC.81209
ISSN: 2581-8627
(Past name: British Journal of Environment & Climate Change, Past ISSN: 2231–4784)

Studies on the Thermal Unit and Heat Use Efficiency Requirement of the Mustard Crop (*Brassica juncea* L.) under Different Ambient Temperatures and Cultivars

Siddhant Gupta [a*], S. R. Mishra [a], A. K. Singh [a] and A. N. Mishra [a]

[a] Department of Agricultural Meteorology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.), 224229, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI:10.9734/IJECC/2022/v12i330646

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers,peer review comments, different versions of the manuscript, comments of the editors. etc are available here: https://www.sdiarticle5.com/review-history/81209

Original Research Article

Received 06 November 2021
Accepted 13 January 2022
Published 24 February 2022

ABSTRACT

A field experiment was directed during the rabi period of 2020-21 in the sandy topsoil of A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). The investigation was directed in Split Plot Design (S.P.D.), comprising of three growing environments/ambient temperature *viz.* 31st October (22.6°C), 10th November(21.2°C), 20th November(19.4°C) and three cultivars *i.e.* NDR-8501 (V1), Kranti (V2) and Varuna (V3). The experiment was replicated four times. Results revealed that the highest thermal unit (1667.2 days) and thermal use efficiency (0.61 g/m²/°days) was recorded at developing climate/encompassing temperature of 31st October (T1) (22.6°C)while least gathered hotness units from planting to development (1468.9°C days) was seen under the developing climate/surrounding temperature of twentieth November. The late-planted mustard crop recorded the least GDD prerequisite at every one of the stages. The least Thermal use proficiency from planting to development 0.435g/m²/°days was seen under developing climate/encompassing temperature (tenth November)(21.2°C). Late planted cultivars recorded the least warm use effectiveness necessity at all stages.

**Corresponding author: E-mail: siddhantg207@gmail.com;*

Indian Journal of Entomology, 81(4): 740-743 (2019) DoI No.: 10.5958/0974-8172.2019.00179.2

SCREENING OF GREEN GRAM GENOTYPES AGAINST SPOTTED POD BORER *MARUCA VITRATA* (F.)

SAMEER KUMAR SINGH* AND P. S. SINGH**

Department of Entomology, College of Agriculture,
Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224229
**Department of Entomology and Agricultural Zoology
Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 221005
*Email: skbhu1991@gmail.com (corresponding author)

Entomological Society of India (ESI)
Member's copy, Not for commercial Sale
entosocindia.org

ABSTRACT

This study evalutes 20 gentotypes of green gram *Vigna radiata* (L.) Wilczek for their susceptibility levels against the spotted pod borer *Maruca vitrata* (F.). The experiment was done during *kharif* 2014 and 2015 at the Agricultural Research Farm, Banaras Hindu University, Varanasi, Uttar Pradesh. The infestation was assessed at the flowering stage based on larval incidence/ plant. The results revealed that the incidence was observed in the 37th standard meteorological week (SMW) with a peak during the 40th SMW, and varied from 0.53 to 3.01 larva/ plant.Maximum larval population was observed in IPM 306-6 followed by IPM 05-3-22 and ML 1256 and the least with PM-5 followed by IPM 306-1 and ML 515. The genotype PM-5 (7.72 q/ ha) closely followed by IPM 306-1 (6.96 q/ ha) and HUM-16 (6.58 q/ ha) gave the maximum yield.

Key words: *Maruca vitrata,* green gram, genotypes, larvae/plant, yield, resistance, susceptible, yield, seasonal incidence

Green gram *Vigna radiata* (L.) Wilczek is one of the important legume crop with its origin in the India-Burma region, and secondary origin as Bihar, Munger district (Singh, 2001). Insect pests play an important role in the production (Swaminathan et al., 2012). Husain et al. (2002) reported more than 150 species of insect pests, out of which 25 species inflict heavy losses. Spotted or legume pod borer *Maruca vitrata* (F.) is the most serious pest, and the low yield is attributed to its regular outbreaks (Singh and Srivastava, 2017). It has extensive host range, is a persistent pest and cause heavy loss (Vishakanthaiah and Jagadeesh, 1980; Singh and Allen, 1980; Zahid et al., 2008). Host plant resistance (HPR) is an important IPM strategy against such pests and it is ecofriendly (Dhillon and Sharma, 2012). The present study evaluates the resistance to the *M. vitrata* in some promising green gram genotypes.

MATERIALS AND METHODS

The screening experiments were conducted during kharif 2014 and 2015 at the Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi. Twenty promising genotypes procured from ICAR- Indian Institute of Pulses Research, Kanpur were evaluated, with the recommended agronomic practices and without pesticides, in Randomized Block Design (RBD) with three replications. The row to row and plant to plant distance was maintained as 30 and 10 cm, respectively, in plot size of 4 x 0.60 m.The population density of *M. vitrata* was estimated by randomly selecting of 5 plants/ plot, at weekly intervals, and observations on pod damage made by counting a total number of pods harvested at the time of maturity. Observations were made on the characteristic *M. vitrata* entry/ exit holes on the pods. For recording grain damage, the pods were opened and the total number of the grain and number of damaged grain were recorded and % worked out. Based on the pod damage, the genotypes were categorized in based on the 1-9 scale (Rani et al., 2008) as follows: Scale/Score: incidence: category- 1: No damage: Resistant; 3:<10% damage: Moderately resistant; 5: 11-10% damage: Tolerant; 7: 21-40% damage: Moderately susceptible; and 9: >40% damage: Highly susceptible. The data on the grain yield were computed to plot yield and per ha yield. The larval population density and % pod and grain damage were subjected to ANOVA (p=0.05) and the treatment means compared using F-test. The data on population, % infestation, % pod and grain damage were subjected to square root and arcsine transformation, respectively before analysis.

J. Exp. Zool. India Vol. 23, No. 2, pp. 1937-1942, 2020 | www.connectjournals.com/jez | *ISSN 0972-0030*

BIOCHEMICAL FACTORS ASSOCIATED WITH RESISTANCE AGAINST PULSE BEETLE, *CALLOSOBRUCHUS CHINENSIS* (L.) IN STORED CHICKPEA GENOTYPES

Lipika Pradhan*[1], P. S. Singh[2], S. K. Singh[3] and R. P. N. Saxena[4]

[1, 2, 4]Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi - 221 005, India.

[3]Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, India.

*e-mail: lipikapradhan2@gmail.com

(Received 26 March 2020, Accepted 5 May 2020)

ABSTRACT : A laboratory experiment was conducted on 15 genotypes of chickpea to investigate the role of some biochemical factors on quantitative losses caused by pulse beetle under storage conditions. The genotype HC-10 (47.92% and 64.00%, respectively) was recorded maximumseed damage and weight loss, while minimum seed damage and weight loss in genotype Digvijay (33.92% and37.99%, respectively). The maximum protein content was recorded in genotype Annegiri (23.67%) followed by HC-10 (23.51%) and PUSA-261 (22.17%). The minimum percentage of protein was recorded in Digvijay (14.20%). The maximum total soluble sugar content was observed in the genotype HC-10 (8.55 mg/g) and followed by PUSA-261 and minimum in genotype CSJD-884 (4.19 mg/g) followed by RSG-931 (4.21 mg/g). Maximum starch content was recorded in genotype HC-10 (50.82 mg/g) followed by PUSA-261 (50.23 mg/g) and minimum in the genotype Digvijay (41.36 mg/g) followed by CSJD-884 (41.98 mg/g). The highest activity of trypsin inhibitor was seen in Digvijay (34.80 TIU/mg protein) and lowest in the genotype HC-10 (7.20 TIU/mg protein). The maximum protease inhibitor activity was observed in Digvijay (31.50%) and followed by CSJD-884 (31.33%) and genotype in HC-10 (14.42%) followed by PUSA-261 (16.12%). A positive significant correlation was observed between per cent seed damage, per cent weight loss and biochemical parameters like protein content (r = 0.650*and r = 0.659, respectively), total soluble sugar (TSS) content (r = 0.961**and r = 0.958**, respectively) and starch content (r = 0.982**and r = 0.981**, respectively), whereas parameters like trypsin inhibitor activity (r = -0.972** and r = -0.970**) and protease inhibitor activity (r = -0.953** and r = -0.948**) were negatively correlated.**

Key words : Chickpea, biochemical factors, genotypes, pulse beetle, *Callosobruchus chinensis*, resistance.

INTRODUCTION

The pulse crops are attacked by more than 150 insect pests. Among these, the pulse beetles, *Callosobruchus* spp. are considered as the major storage pests of pulses. It has been reported that the genus *Callosobruchus* is a serious insect pest in the middle and Far East, Africa and India. Different pulse beetles attacking various pulses are *Callosobruchus chinensis*, *C. maculatus* and *C. analis*. The most destructive bruchid species to chickpea are *C. chinensis* and *C. maculatus* (Mishra *et al*, 2015). All most all pulse crops have been reported to be infested by this beetle all over the world (Singh *et al*, 1980). It is an oligophagous and cosmopolitan insect pest. Its infestation starts from the field and then carried to the storage. It refers to causes both pre and post-harvest losses in grain legumes. It is not only caused qualitative and quantitative losses but also impacts on germination ability of seeds. It is observed that up to 60 per cent of weight loss and 45.50 to 66.30 per cent loss in protein content of stored pulse seeds occur due to pulse beetle infestation (Golnaz *et al*, 2011; Faruk *et al*, 2011). Due to infestation, seeds undergo biochemical alterations which result in the loss of various constituents of the seeds. Grubs and adults both cause damage. Grubs eat up the endosperm of the grain kernel and make a cavity. Affected grains show emergence holes of beetles as well as minute white eggs adhering to the seed coat. This is the main evidence for pulse beetle damage. It makes the seeds unfit for consumption and useless as seed as well. The pulse beetles deteriorate the seed quality by denaturing and decreasing the soluble proteins (Mishra *et al*, 2015).

J. Exp. Zool. India Vol. 23, No. 2, pp. 1175-1180, 2020 | www.connectjournals.com/jez | *ISSN 0972-0030*

BIOCHEMICAL BASIS OF RESISTANCE AGAINST PULSE BEETLE, *CALLOSOBRUCHUS CHINENSIS* (L.) IN STORED CHICKPEA GENOTYPES

Kancherla Lakshmi Deepika*[1], P. S. Singh[2], S. K. Singh[3] and R. P. N. Saxena[4]

[1, 2, 4]Department of Entomology and Agricultural Zoology, Banaras Hindu University, Varanasi - 221 005, India.
[3]Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, India.
*e-mail: srideepu555@gmail.com

(Received 12 March 2020, Accepted 5 May 2020)

ABSTRACT : A laboratory experiment was conducted to determine the resistance of 15 chickpea genotypes against pulse beetle, *Callosobruchus chinensis* (L.). The minimum seed damage was recorded in JG 315 (27.75%) followed by genotype DCP 92-3 (28.00%). The genotype JG 11 recorded the highest per cent seed damage (50.50%) followed by Chaffa (48.75%). The maximum per cent loss in weight occurred in Chaffa (62.48%) followed by genotype H 82-2 (HC-1) (49.04%) and the minimum per cent weight loss was recorded on PBG 5 (33.92%) followed by GNG 469 (34.16%). The lowest protein content was recorded in genotype JG 315 (15.33%), Vikas (15.33%) and the highest protein content was recorded in genotype JG 11(22.70%) followed by Chaffa (22.67%). The lowest starch content was recorded in the genotype JG 315 (37.67 mg/g) followed by genotype Vikas (38 mg/g) and the highest starch content was noticed in genotype JG 11(48.67mg/g) and Chaffa (48.67mg/g). The minimum total soluble sugar content was found in genotype JG 315 (3.33 mg/g) followed by genotype Vikas (4.20 mg/g). The maximum total soluble sugar content was recorded in genotype JG 11 (9.63mg/g) followed by genotype Chaffa (9.58 mg/g). The highest trypsin inhibitor activity (TIU/mg protein) was seen in genotype JG 315 (39.67) followed by genotype Vikas (32.50) and the lowest trypsin inhibitor activity (TIU/mg of protein) was found in genotype JG 11(9.40) followed by genotype Chaffa (10.40 TIU/mg protein). The highest protease inhibitor activity was noticed in the genotype JG 315 (29.00%) followed by genotype Vikas (27.00%) and the lowest per cent protease inhibitor activity genotype was JG 11 (12.00%) followed by genotype Chaffa (13.00%). The negative and significant correlation between seed damage, weight loss and trypsin inhibitor activity, protease inhibitor activity was found. The significant positive correlation between seed damage and protein content, starch content and total soluble sugars was found, while a positive correlation between weight loss protein content, starch content and total soluble sugars was observed.

Key words : *Callosobruchus chinensis*, chickpea, biochemical, resistance, genotypes.

INTRODUCTION

Legumes are among the richest food sources of proteins and amino acids for human and animal nutrition. For the majority of the vegetarian population in India, pulses are the major source of protein. Pulses and pulse crop residues are also major sources of high-quality livestock feed. Chickpea is the premier pulse crop of the Indian subcontinent. It is considered as thebest alternative to animal protein for poor masses of the country. Seeds have about 20% protein, 5% fat and 55% carbohydrate. In addition to protein, chickpea is a good source of carbohydrates, dietary fibre, minerals (molybdenum, manganese, copper, phosphorus, iron and zinc) and vitamins (riboflavin, niacin, thiamin, folate and the vitamin 'A' precursor beta-carotene) (Jukanti *et al*, 2012). The *in vitro* protein digestibility of chickpea seeds was found to be higher compared with those for pigeon pea, green gram, black gram and soybean (Chitra *et al*, 1995).

Insects are not only causing damage to the crops growing in the field but also causing qualitative and quantitative damage under storage. Significant losses in grains occur during storage and the damage caused by insects may amount to 5-10 per cent in the temperate and 20 – 30 per cent in the tropical zone (Nakakita, 1998).

In India over 200 species of insects have been recorded infesting various pulses and out of five known species of *Callosobruchus*; the only three names, *Callosobruchus chinensis*, *C. maculatus* and *C. analis* are most common species of pulse beetle found in India to infest stored legumes (Raina, 1970). The pulse beetle,

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(2): 148-154
© 2020 IJCS
Received: 28-01-2020
Accepted: 30-02-2020

Alka Sahrawat
Shobhit Institute of Engineering and Technology, Meerut, Uttar Pradesh, India

Siddarth N Rahul
A.N.D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Sameer K Singh
A.N.D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Shweta Patel
A.N.D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Siddarth N Rahul
A.N.D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

The potential benefits of weeds: A comparative study: A review

Alka Sahrawat, Siddarth N Rahul, Sameer K Singh and Shweta Patel

DOI: https://doi.org/10.22271/chemi.2020.v8.i2b.10134

Abstract
A weed in a general sense is a plant, usually wild or feral, that is commonly considered to be a nuisance in a garden, lawn, or other agri-cultural development. More specifically the term is often used to describe plants that grow and reproduce aggressively. Weeds may be unwanted because they are unsightly, or because they limit the growth of other plants by blocking light or using up nutrients from the soil. The term weed in its general sense is a subjective one, without any classification value, since a plant or herb is not a weed when growing where it belongs or is wanted. Despite of being harmful some weeds are called, beneficial plants or herbs as they are edible, use for food or herbal medicine. Other advantage of such beneficial herbs may be the keeping away of some insect pests of crops. Many researchers have pointed out that there is scarce evidence to prove that pests move from the alternative host in sufficient numbers to cause significant crop damage, even in the case of pests such as some of the aphids which are obliged to alternate between hosts to complete their life cycle.

Keywords: Weed, harmful, beneficial effect, alternate host

Introduction
Weeds are defined as any plants that are growing in unwanted areas or plants growing in everlastingly human-disturbed environments but do not depend on human interference for reproduction and survival. These plants may be found growing on agricultural fields and gardens or as ruderal plants (Ngugi *et al.* 1978; Stephen 1982; Casas *et al.*1996) [1, 85, 3]. Weeds are usually seen to have adverse effects not only in agricultural lands but also in natural wild ecosystems. In terms of agriculture these plants compete against crop plants for available resources, lower the quality of agricultural produce, lower quality of pastures. Despite of these some are poisonous, increase costs of production, harbor pests, while some block irrigation after growing immeasurably (Ngugi *et al.* 1978; Klingman *et al.* 1982; Ivens 1989; Cousens & Mortimer1995) [1, 4, 5, 6]. In concern to biodiversity conservation considerations weed and other aggressive species are often supposed to act as "plant pests" (Miller 1999), one of the two major threats to biodiversity, second to habitat damage (Heywood 1995; Mungoro & Tezoo 1999) [8, 9]. This may be especially so when weed species are lack natural enemies, grow faster than native plant species and are able to produce plenty of seeds (Richardson *et al.* 1992) [10]. The species which grow on their own, without human efforts can be termed as weeds. They are in general harmful to the crops and can dominate the vegetation if not cared for. The weeds are of no use as they are harmful to crop. They are generally controlled from crop fields and destroyed. Many of the weeds are found to be medicinally important. Such weeds can be collected from crop fields and used for curing the diseases.

Losses caused by weed
The losses caused by weeds exceed the losses from any other category of agricultural pests, such as insects, nematodes and rodents. Among the total annual losses of agricultural product from various pest, weeds account for 45%, insects for 30%, diseases 20% and other pest 5% as shown in Figure 1 (Rao 2000) [81]

DOI : 10.5958/0974-4576.2020.00090.0

©MPH J. ent. Res., 44 (4) : 535-539 (2020)

Evaluation of certain chickpea genotypes against pulse beetle, *Callosobruchus chinensis* (L.) under laboratory conditions

Lipika Pradhan*, P.S. Singh, S.K. Singh and R.P.N. Saxena**

Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi - 221 005, Uttar Pradesh, India

ABSTRACT

Screening of fifteen chickpea genotypes namely GNG-146, HC-3, PUSA-209, Digvijay, Radhey-931, Annegiri, PBG-5, PUSA-261, HC-10, CSJD-884, GCP-101, RSG-10, RSG-931, L-550 and C-235 were conducted to quantify the losses caused by pulse beetle. The results revealed that the mean per cent of seed damage varied from 33.92 to 47.92% and mean per cent weight loss of chickpea seeds varied from 37.99 to 64.00%. The mean per cent seed damage was highest in the genotype HC-10 (47.92%) and lowest in Digvijay (33.92%). The genotype HC-10 (64.00%) recorded maximum per cent weight loss whereas; the genotype Digvijay recorded minimum per cent weight loss (37.99%). Among all the 15 genotypes; resistant genotype was Digvijay followed by CSJD-884, RSG-931, GNG-146, Radhey-931, L-550 and GCP-101. Most susceptible genotype was HC-10 followed by PUSA-261, RSG-10, HC-3, PBG-5, C-235, Annegiri and PUSA-209.

Key words : Chickpea, evaluation, genotypes, laboratory conditions, pulse beetle, pulse beetle.

INTRODUCTION

Pulses are an excellent source of dietary proteins (20-40%), carbohydrates (50-60%) and minerals like calcium and iron (Borget, 1992; Ofuya and Akhidue, 2005). India occupies the first position in pulse production in the world and contributes around 70 per cent (Anonymous, 2015). Although, being the largest pulse crops cultivating country in the world, in domestic food grains sector, pulses occupy only 7 per cent share in global production (Department of Agriculture and Cooperation, Ministry of Agriculture, New Delhi, 2015). Among all the grain legumes, Chickpea (*Cicer arietinum*) is considered to be the best food for the vegetarian population in South Asia, West Asia and Southern European countries. It acquires the fourth position based on both cultivated area and production in the world among all the pulses (FAOSTAT, 2014). It is commonly known as Bengal gram or White gram or Gram. The state contributing largest production in gram is Madhya Pradesh covering about 9.93 m ha area with the production of 7.17 mt (Anonymous, 2015). The average productivity of chickpea is about 800 kg/ha, which is much lower than their potential yields.

Several biotic and abiotic constraints are there which causes major yield loss. The biotic constraints include diseases and insect pests causing a yield loss of about 30% (Birthal and Sharma, 2004). The most destructive bruchid species to chickpea are *Callosobruchus chinensis* (L.) and *C. maculatus* (F.) (Mishra *et al*., 2015). It is observed that up to 60 per cent of weight loss of the stored seeds occurs due to pulse beetle (Golnaz *et al*., 2011). Pulse beetles are of the family Bruchidae and order Coleoptera. The life cycle of pulse beetle is studied by many workers. Egg, larval and pupal periods of pulse beetles are 3, 12 and 4 days respectively. White, elongate eggs are laid on the pulse. The grubs feed on the inner contents of pulses, pupate inside them and emerge out by cutting circular holes in the grains. It is reported that adults prefer to come on the surface of the layer of grains to get the free area for mating (Kunhikannan, 1919). Use of resistant or tolerant cultivars reduce the indiscriminate use of insecticides and involves no extra cost to the farmers and is an ideal way of effective, economical and safe management of insect pests. Resistance processes involve morphological,

*Corresponding author's E-mail : lipikapradhan2@gmail.com

**Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, Uttar Pradesh, India

DOI : 10.5958/0974-4576.2020.00091.2

©MPH J. ent. Res., 44 (4) : 541-546 (2020)

Biochemical basis of resistance in green gram genotypes against pulse beetle, *Callosobruchus maculatus* (F.) under storage conditions

Usha R.*, P.S. Singh, S.K. Singh and R.P.N. Saxena**

Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi - 221 005, Uttar Pradesh, India

ABSTRACT

Study on the biochemical basis of resistance in green gram genotypes against pulse beetle showed that highest seed damage was recorded in genotype Pant Mung-2 (69.25%) whereas, lowest seed damage was found in genotype ML-935 (46.50%). The maximum weight loss was recorded in genotype Pant Mung-2 (43.00%) and minimum weight loss was recorded on ML-935 (11.67%). The lowest protein content was recorded in genotype ML-935 (11.50 mg/g) while, highest protein content was reported in genotype Samrat (27.70 mg/g) followed by Pant Mung-2 (26.90 mg/g). The genotypes Samrat (40.36 mg/g) had the highest starch content followed by Pant Mung-2 (39.00 mg/g) and genotype ML-935 (26.53 mg/g) had the lowest starch content. The genotype Samrat (8.66 mg/g) received highest sugar content followed by Pant Mung-2 (7.90 mg/g) and genotype ML-935 (2.96 mg/g) received the lowest content of total soluble sugar. The genotype ML-935 (17.03 TIU/mg protein) showed highest trypsin inhibitor activity followed by ML1059 (14.50 TIU/ mg protein). The genotype Samrat (11.37 TIU/ mg protein) depicted lowest trypsin inhibitor activity followed by genotype Pant Mung-2 (11.90 TIU/ mg protein). The genotype ML-935 (29.06%) had the highest protease inhibitor activity followed by genotype ML1059 (26.50%). The genotype IPM-2-3 (17.16%) followed by genotype Ganga-8 (17.50%) showed protease inhibitor activity. A positive significant correlation was observed between per cent seed damage, per cent weight loss and biochemical parameters like protein content (r = 0.892 and r = 0.881**, respectively), starch content (r = 0.924** and r = 0.895**, respectively) and total soluble sugar (TSS) content (r = 0.886** and r = 0.855**, respectively), whereas parameters like trypsin inhibitor activity (r = -0.891** and r = -0.871****, respectively) and protease inhibitor activity (r = -0.937** and r = -0.921****, respectively) were negatively correlated.**

Key words : Biochemical, *Callosobruchus maculatus*, genotypes, green gram, pulse beetle, resistance.

INTRODUCTION

Pulses are an important source of protein, high in fibre content and provide ample quantity of vitamins and minerals. Keeping in view the large benefits of pulses for human health, the United Nations has proclaimed 2016 as the International Year of Pulses. Green gram is an important pulses crop in India and believed to be originated from India. It is a short-duration legume crop grown mostly as a fallow crop in rotation with rice. Similar to the leguminous pulses, green gram, enrich soil nitrogen content. It is grown mostly in the Asian region traditionally while its cultivation has spread to Africa and the Americas relatively in recent times. More than 70% of the world's green gram production comes from India.

In India among various pulses, green gram stands third and contributes 11% of the total pulse production with 1.61 mt from an area of about 3.42 m ha. The average yield of green gram is 512 kg/ha (INDIASTAT, 2015). Sprouted pulse seeds are rich in vitamin B, C and enzymes. Besides its nutritive value, it also plays an important role in improving soil physical properties and fixing atmospheric nitrogen (22 kg/ha) through a symbiotic relationship with rhizobium in the root nodule of the crop. Despite the economic and nutritional benefits, there are many constraints responsible for the low yield of mung bean. Among those, insect pests are considered to be most important (Chandrasekhar and Ghosh, 2002; Soumia *et al.,* 2015).

*Corresponding author's E-mail : ushar0056@gmail.com

**Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, Uttar Pradesh, India

Comparative efficacy and economics of certain insecticides against gram pod borer, *Helicoverpa armigera* (Hübner) in chickpea

Ram Ratna Upadhyay, P S Singh and Sameer Kumar Singh[1]

Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India

[1]Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, Uttar Pradesh, India

E-mail: skbhu1991@gmail.com

Abstract

A field investigation was conducted to evaluate the comparative efficacy of certain insecticides against Helicoverpa armigera *(Hübner) infesting chickpea at Agriculture Research Farm, Banaras Hindu University, Varanasi, U.P., during Rabi 2017-18. The results revealed that Chlorantiniprole 18.5 SC 92g a.i. ha^{-1} followed by Flubendamide 39.35 EC 49g a.i. ha^{-1} and Spinosad 45 SC 74g a.i. ha^{-1} were found most effective in reducing* H. armigera *population and pod damage. The highest yield was recorded in the treatment Chlorantiniprole 18.5 SC 92g a.i. ha^{-1} (17.33 q ha^{-1}) followed by Flubendamide 39.35 EC 49g a.i. ha^{-1} (16.44 q ha^{-1}) and Spinosad 45 SC 74g a.i. ha^{-1} (15.55 q ha^{-1}). The maximum yield increase over control was recorded in treatment Chlorantiniprole 18.5 SC 92g a.i. ha^{-1} (97.60%) and minimum in treatment Acephate 75 WP 750 g a.i. ha^{-1} (14.48%). The highest avoidable yield loss was recorded in Chlorantiniprole 18.5 SC 92g a.i. ha^{-1} (49.39%) and lowest avoidable yield losses were noticed in Acephate 75 WP 750 g a.i. ha^{-1} (12.64%). The highest benefit: cost ratio was observed in Indoxacarb 14.5 EC 36 g a.i. ha^{-1} (7.78:1) and lowest benefit: cost ratio was recorded from Chlorantiniprole 18.5 SC 92g a.i. ha^{-1} (1.19:1).*

Keywords: Comparative efficacy, insecticides, economics, gram pod borer, chickpea and *Helicoverpa armigera.*

Introduction

India is the largest in terms of area and production of chickpea in the world *i.e.* approximately 70 per cent of total chickpea production in the world (Wallace *et al*., 2016). History of chickpea can be traced since ancient times in India but it was reported first cultivated 7000 years ago in Middle East Asia from where it descended to Afghanistan and finally to India (Toker, 2009). Chickpea is the second most important food legume crop after common bean (FAOSTAT, 2015). Currently, chickpea is being cultivated in about 40 countries in the world and it is a very important part of pulse cultivation in the world , contributing about 58 million tonns produced which is approximately 15 per cent of the total pulse harvested all over the world. Nearly 90 per cent of the total global area and 88 per cent of total production is concentrated in Asia. India with the first rank in production is followed by Turkey (11%), Pakistan (8%), Iran and Syria (Kapoor *et al.,* 2010).

One of the main constrains in increasing the production of chickpea are insect pests. The number of insect pest species attacking the chickpea in Indian terrain is 57, and the economically important pests among them are nearly half a dozen. The most important insect species in terms of damage to the crop is the gram pod borer, *Helicoverpa armigera* Hübner (Lepidoptera: Noctuidae). The insect causes most damage in terms of attacking the economical part of the plant *i.e.* the pod and hence decreases the yield of the crop drastically. The pod borer has been a significant problem with a variety of crops for its polyphagous nature. The attack of pod borer is reported on nearly 182 economically important crop plant species ranging from food to fibre crops, horticulture crops and oil seeds etc. (Gowda, 2007).

The estimation of yield losses in case of *Helicoverpa* in case of chickpea are variable in case of variations of the weather conditions i.e. under normal weather conditions the losses by pod borer to chickpea crop may vary between 10-60 percent while in case of favourable weather conditions the loss can be in the range of 50-100 percent leading to total devastation of the crop (Khare and

J. Exp. Zool. India Vol. 24, No. 2, pp. 1167-1170, 2021	www.connectjournals.com/jez	*ISSN 0972-0030*
DocID: https://connectjournals.com/03895.2021.24.1167		eISSN 0976-1780

EVALUATION OF CERTAIN FRENCH BEAN (*PHASEOLUS VULGARIS* L.) GENOTYPES AGAINST MAJOR INSECT PESTS

Abhishek Sahu[1]*, P. S. Singh[2] and Sameer Kumar Singh[3]

[1&2]Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, B. H. U., Varanasi - 221 005, India.
[3]Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, India.
*e-mail : abhisekhsahu4795@gmail.com

(Received 27 February 2021, Accepted 24 April 2021)

ABSTRACT : The various genotypes of French bean obtained from Indian Institute of Pulses Research, Kanpur were sown at Agricultural Research Farm of Banaras Hindu University during the Rabi season of 2017-18 for assessing the resistance to leaf miner, aphid and pod borer. Genotype VL 63 showed resistant reaction to aphid (7.83 aphids/plant) compared to all other varieties, whereas, genotypes 405 (56.83 aphids/plant) and RE 15-1 (51.11 aphids/plant) showed susceptible reaction. Genotype RE 15-1 showed resistant reaction to leaf miner damage on leaves (13.27%), whereas, genotypes HUR 15 (27.04%) and 180 (24.87%) showed susceptible reaction with higher leaf damage. Pod damage due to pod borer (*Helicoverpa armigera*) was highest on genotype VL 63 (3.67%) and least incidence was recorded on genotype HUR 76 (0.33%). Genotype HUR 76 produced highest yield as compared to other genotypes (12.00 q ha^{-1}), while genotype 214 and 96 (6.67 q ha^{-1}) produced lowest yield.

Key words : *Phaseolus vulgaris*, *Chromatomyia horticola*, *Aphis craccivora*, *Helicoverpa armigera*.

How to cite : Abhishek Sahu, P. S. Singh and Sameer Kumar Singh (2021) Evaluation of certain French bean (*Phaseolus vulgaris* L.) genotypes against major insect pests. *J. Exp. Zool. India* **24**, 1167-1170. DocID: https://connectjournals.com/03895.2021.24.1167

INTRODUCTION

French bean, *Phaseolus vulgaris* L. that belongs to family Fabaceae also known as Rajmash, Snap bean, Kidney bean and Garden bean is an important source of protein for many developing countries (Markart, 1985). It approximately amounts to 90 per cent of total bean production (Dessert and Voysest, 1991). Its nutritional values indicates that it is rich in carbohydrates, sodium, protein, vitamin B_6, B_{12}, zinc, copper, manganese and essential amino acids like Thiamine, Lysine, Leucine, Proline, Glycine, Serine and Glutamic acid. It is highly nutritious, its dry seeds contain 22 per cent protein, 1.7 per cent fat, 78 per cent carbohydrate, 381 mg calcium, 425 mg phosphorus and 12.4 mg iron per 100 g of edible proteins (Joshi and Rana, 1995). The beans are used as a green vegetable, green shelled or dry as pulses according to the stage of harvest. In temperate regions, green mature pods are cooked and eaten as vegetable. Immature pods are marketed as fresh, frozen or canned, whole or fresh cut (Kaplan and Lynch, 1999). The immature pods of this crop are consumed as vegetable and dried seeds form an excellent pulse. It is said to be anti-diabetic and good for bladder burns, diarrhoea, dropsy, dysentery, eczema and hiccups. Use of improved quality seeds and unscrupulous application of chemical insecticide has led to adverse effects upon plant, animal, human and environmental health. Several workers *viz*., Rahman (1988), Sachan and Garg (1992), Sharma (1999), Singh (2013), Noor *et al* (2014) & Singh and Singh (2015) have reported insect pests of French bean from various regions of India. Development of cultivars with resistant traits against major insect pests would be an efficient, cost effective and sustainable mode for providing the best way to manage pest menace (Lateef, 1991). Taking into account the above facts, investigation was carried out to screen certain genotypes of French bean against major insect pests.

MATERIALS AND METHODS

The study was convened and investigation was carried out for evaluating resistance of 20 Rajmash genotypes against leaf miner (*Chromatomyia horticola*), aphid (*Aphis craccivora*) and pod borer (*Helicoverpa armigera*) at Agricultural Research Farm, Banaras Hindu University, Varanasi, Uttar Pradesh during *Rabi* 2017-18. All twenty genotypes were sown adopting Randomised

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 975-978
© 2021 TPI
www.thepharmajournal.com
Received: 05-08-2021
Accepted: 13-09-2021

Dharm Beer
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Jai Kumar Yadav
Department of Plant Protecton, ICAR-V.K.S. Krishi Vigyan Kendra Unnao, Unnao, Uttar Pradesh, India

Sameer Kumar Singh
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Dharm Beer
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Population dynamics of fruit flies in bitter gourd (*Momordica charantia* L.) and its relationship with weather factors

Dharm Beer, Umesh Chandra, Jai Kumar Yadav and Sameer Kumar Singh

Abstract
Bitter gourd (*Momordica charantia* L.) is one of the important cucurbitaceous vegetable grown in India. Among the cucurbits, it is considered a high-quality vegetable because of its nutritive value especially ascorbic acid and iron. The study was undertaken to investigate the population dynamics of *Bactrocera* spp. (Diptera: Tephritidae) round the year. Significant variation in occurrence of the pest was recorded during the period of investigation. First incidence of *Bactrocera* spp. was observed from 31st SM and continued upto 52nd SM in parapheromone Methyl Eugenol and Cuelure) traps. Peak incidence of the pest was recorded during 39th SM and 42nd SM with 135 fruit flies/trap/week. *B. zonata* and *B. dorsalis* incidence had significant positive correlation (r) of with minimum and maximum temperature (r = 0.563 and r = 0.564 respectively) during *Kharif* 2018. The *B. cucurbitae* traped had positive correlation with minimum (r = 0.752), maximum temperature (r = 0.788) and relative humidity during *Kharif* 2018. Findings of this study helps in understanding the population dynamics of fruits flies in bitter gourd and developing forewarning strategies to combact the pest in advance.

Keywords: Bitter gourd, fruit fly, incidence, cuelure, methyl eugenol

Introduction
Bitter gourd is an important cucurbitaceous vegetable grown in India. Each part of this crop has been reported useful having some specific medicinal value (Allwood and Drew, 1996) [1]. Fruit flies are important insect pests of fruits, vegetables and other ornamental plants (Bharathi *et al.,* 2004) [5]. Melon fruit fly, *Bactrocera cucurbitae* (Coq.) (Diptera: Tephritidae) is one of the main tropical fruit fly causing considerable damage in cucurbits. *B. cucurbitae* has been observed to infest a wide range of crops in the Cucurbitaceous family. Infestation by melon fruit fly in bitter gourd was reported from 41 to 89 per cent (Rabindranath and Pillai, 1986). Melon fruit fly infests 95 percent of bitter gourd fruits in Papua New Guinea, 90 per cent snake gourd and 60 to 87 per cent pumpkin fruits in Solomon Island while 31.27 per cent in India, respectively (Hollingsworth *et. al*., 1997; Singh *et. al*., 2000) [9, 10]. Yield loss varies from 30–100% (Nath and Bhusan 2006) [2]. It is very much difficult to manage the pest through the application of chemical pesticides due to their peculiar biological features.
Among the various, alternate strategies available for the management of fruit flies, the use of male attractant traps stands as the most outstanding alternative. Various parapheromones are known which are used against fruit flies. Monitoring of pest population round the year is one of the most important basic information in formulating Integrated Pest Management concept for sustainable agriculture. The Cuelure traps have been reported to attract *Bactrocera cucurbitae* males and this sex attractant is more effective than food lure (Pawar *et. al*., 1991, Liu and Lin, 1993; Zaman, 1995) [3, 8, 4]. Keeping in view, present investigation was undertaken to study the population dynamics of fruit flies and its relation with weather factors.

Materials and Method
The study was conducted at the Agricultural Research Farm of Acharya Narendra Dev University of Agriculture and Technology, Kumarganj Ayodhya, India (26.54°N, 81.93°E). The seasonal incidence of fruit flies was monitored at weekly intervals in the cropping season 2018–2019. Cuelure and methyl eugenol baited bottle traps were used for the monitoring of population. The traps used for monitoring fruit flies consisted of a one-litre plastic mineral water bottle (10 cm base diameter and 25 cm in height) with a screw lid.

RESEARCH ARTICLE Legume Research- An International Journal, Volume 44 Issue 11: 1398-1401 (November 2021)

Biochemical Factors Associated with Resistance to Spotted Pod Borer, *Maruca vitrata* (Fabricius) in Green Gram

Sameer Kumar Singh[1], P.S. Singh

10.18805/LR-4302

ABSTRACT

Background: Legume pod borer or spotted pod borer, *Maruca vitrata* is one of the serious insect pest to the green gram, which causes damage mainly at the reproductive phase of the crop growth. The larvae of spotted pod borer are known to cause damage by webbing the leaves, bud, flower and pods together and feed from inside on them. Due to its webbing nature, it is very difficult to enter inside by natural enemies and chemicals cannot directly reach inside webbing. Host plant resistance to insect pests is an economically and ecologically preferred alternative as compared to other pest management tactics, particularly the synthetic pesticides. The present investigation was undertaken to examine the role of certain bio-chemical constituents of the immature pods of green gram in the expression of damage by the spotted pod borer.

Methods: The experiments on screening were conducted during the *kharif* 2014 and 2015 at the Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (U.P.) to define the occurrence of *M. vitrata* on 20 promising varieties/ genotypes of green gram. Pods were collected at the immature stage from different varieties/genotypes and biochemical constituents such as total soluble sugar, total chlorophyll, protein were estimated.

Result: The maximum protein content was found in genotype IPM 306-6 (36.17 mg/g) and minimum in genotype PM-5 (20.53 mg/g). Highest total sugar content was reported from genotype ML 1256 (16.71 mg/g) and lowest total sugar content was recorded in PM-5 (10.94 mg/g).The phenol content in genotype PM-5 (9.00 mg/g) was significantly higher than others whereas, the minimum phenol content was reported in IPM 306-6 (5.14 mg/g). The higher amount of total chlorophyll content found in genotype IPM 306-6 (3.22 mg/g) and lowest in PM-5 (1.85 mg/g). The significant and positive correlation was observed between *M. vitrata* larval population, pod damage and protein (r=0.954** and r=0.952**, respectively) and total sugar content (r=0.986** and r=0.986**, respectively) and total chlorophyll content (r=0.994** and r=0.993**, respectively) in immature pods, while, the significant and negative correlation was found between phenol (r= -0.916** and r= -0.919**, respectively).

Key words: Biochemical factors, Green gram, Genotypes and resistance, *Maruca vitrata*.

INTRODUCTION

The insect pests such as jassids, whitefly, thrips, stem fly, Epilachna beetle, blister beetle, Galerucid beetle, pod sucking bug, spotted pod borer and tobacco caterpillar have more significance on mungbean throughout the year. Incidence of insect pests considerably reduces the yield and quality of mungbean (Elias ***et al***., 1986; Malik, 1994; Singh and Singh, 2014; Soundararajan ***et al***., 2013). Among the pod borers, legume pod borer or spotted pod borer, ***Maruca vitrata*** is one of the insect serious pest to the green gram, which causes damage mainly at the reproductive phase of the crop growth. Because of its extensive host range and destructiveness, it became a persistent pest in pulses particularly on the green gram, as it is available throughout the year in different seasons. The larvae of spotted pod borer are known to cause damage by webbing the leaves, bud, flower and pods together and feed from inside on them. Due to its webbing nature, it is very difficult to enter inside by natural enemies and chemicals cannot directly reach inside webbing. Host plant resistance to insect pests is an economically and ecologically preferred alternative as compared to other pest management tactics, particularly the synthetic pesticides (Barad ***et al***., 2016). Zahid ***et al***. (2008) had reported 20-30 per cent pod damage in mungbean. It is known to cause an economic loss of 20-25 per cent and yield loss of 2-84 per cent in green gram (Vishakanthaiah and Jagadeesh Babu, 1980; Umbarkar ***et al***., 2011a). Various biochemical compounds present in the plant parts play an important role in offering host plant resistance in suppressing the insect pests. The present investigation was undertaken to examine the role of certain bio-chemical

Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi-221 005, Uttar Pradesh, India.

[1]Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224 229, Uttar Pradesh, India.

Corresponding Author: Sameer Kumar Singh, Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224 229, Uttar Pradesh, India. Email: skbhu1991@gmail.com

How to cite this article: Singh, S.K. and Singh, P.S. (2021). Biochemical Factors Associated with Resistance to Spotted Pod Borer, *Maruca Vitrata* (Fabricius) in Green Gram. Legume Research. 44(11): 1398-1401. DOI: 10.18805/LR-4302.

Submitted: 17-12-2019 **Accepted:** 03-06-2020 **Online:** 09-11-2020

DOI : 10.5958/0974-4576.2021.00143.2

©MPH J. ent. Res., 45 (Suppl.) : 924-928 (2021)

Biochemical traits associated with resistance to Whitefly, *Bemisia tabaci* (Gennadius) in green gram

Sameer Kumar Singh* and P.S. Singh**

Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, Uttar Pradesh, India

ABSTRACT

Results revealed that maximum population was reported in ML 5 (9.12 whitefly cage-1) followed by SM 48 (8.45 whitefly cage^{-1}) and the minimum population was recorded in PM-5 (3.02 whitefly cage^{-1}) closely followed by IPM 306-1 (3.51 whitefly cage^{-1}). However, the population local check cultivar, HUM-12 was 6.45 whitefly cage^{-1}. The biochemical factors like protein, total sugar, phenol and total chlorophyll were estimated in 20 promising varieties/ genotypes of green gram. The highest protein content was found in genotype ML 5 (12.77 mg g^{-1}) and minimum in genotype PM-5 (7.45 mg g^{-1}). Maximum total sugar content was reported from genotype ML 5 (07.86 mg g^{-1}) and minimum total sugar content recorded in PM-5 (03.34 mg g^{-1}). The phenol content in genotype PM-5 (4.23 mg g^{-1}) was significantly higher than others whereas, the minimum phenol content was reported in ML5 (2.43 mg g^{-1}). The higher amount of total chlorophyll content was found in genotype PM-5 (3.92 mg g^{-1}) and lower in genotype ML 5 (1.30 mg g^{-1}). The significant and positive correlation was witnessed between *B. tabaci* population and protein (r=0.976) and total sugar content (r=0.981**), while, the significant and negative correlation was found between phenol (r = -981**) and total chlorophyll content (r = -978**).**

Key words : *Bemisia tabaci*, biochemical traits, genotypes and resistance, green gram.

INTRODUCTION

The damage caused by insect pest is one of the major reason for the low productivity of mungbean in the country. In India, nearly 60 species of insect pests have been recorded from mungbean but only a few cause economic damage and are more common in large areas (Ooi, 1973; Soundararajan *et al*., 2013; Singh and Singh, 2014). Chhabra and Kooner (1985) noted 54.90% yield losses caused by pest complex in green gram. Whitefly, being one of the major pest of green gram, sucks the sap from under the surface of leaves resulting in chlorotic spot development, become reddish and crop premature growth. It also leads to the development of sooty mould on leaves, interfering with photosynthetic activity. It is a potential vector of mungbean yellow mosaic virus (MYMV), can cause losses ranging from 30 - 70% (Swaminathan *et al*., 2012). The whitefly, *Bemisia tabaci* is reported to infest the crop at different places on India (Naraiani, 1960; Srivatava and Singh, 1976; Chhabra *et al*., 1979; Lal *et al*., 1980; Chhabra and Kooner, 1981, Singh and Singh, 2014). These workers have also reported the indirect damage by whitefly to this by transmitting Yellow Mosaic Virus. Various biochemical compounds existing in the plants play vital role in offering host plant resistance in suppressing the insect pests. The present investigation was undertaken to study the role of certain bio-chemical components of the leaf of green gram in the expression of damage by whitefly.

*Corresponding author's E-mail : skbhu1991@gmail.com
**Department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi - 221 005, Uttar Pradesh, India

MATERIALS AND METHODS

The research experiments of screening to find out the occurrence of *B. tabaci* on 20 promising varieties/ genotypes of green gram obtained from ICAR-Indian Institute of Pulses Research, Kanpur (U.P.) were conducted during the *kharif* 2014 and 2015 at Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, (U.P.). The recommended cultural practices without using pesticides were followed in rising of the crop. All varieties/genotypes were grown in Randomized Block Design (RBD) with three replications. The row to row and plant to plant distance was kept as 30 cm and 10 cm, respectively. The unit plot size was 4

J. Exp. Zool. India Vol. 25, No. 1, pp. 553-556, 2022	www.connectjournals.com/jez	*ISSN 0972-0030*
DocID: https://connectjournals.com/03895.2022.25.553		eISSN 0976-1780

POPULATION DYNAMICS OF GRAM POD BORER, *HELICOVERPA ARMIGERA* (HÜBNER) IN RELATION TO ABIOTIC FACTORS ON CHICKPEA

Nitish Kumar Alok, Sameer Kumar Singh* and Umesh Chandra

Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, India.
*e-mail: skbhu1991@gmail.com

(Received 10 September 2021, Accepted 18 November 2021)

ABSTRACT : A field investigation was conducted on the population dynamics of *Helicoverpa armigera* (Hübner) in chickpea during *Rabi* 2020-21. The results revealed that the infestation of gram pod borer started at 46th SMW with a mean population of 0.22 larvae/mrl and attained ETL at 48th SMW with 1.00 larvae/mrl. The peak appearance was recorded during 8th SMW with an average population of 8.80 larvae/mrl and it persisted up to 15th SMW with 0.40 larvae/mrl. The larvae population of H. armigera correlated with abiotic parameters and data revealed a negative non-significant correlation with maximum and minimum temperatures (r= -0.337 and r= -0.321, respectively), however, it showed a positive correlation with relative humidity in the morning which was non-significant and with evening relative humidity, it was significant (r= 0.296 and r = 0.496*, respectively) and there was no rainfall observed during the cropping season. Wind speed and sunshine hours also showed a positive non-significant correlation (r = 0.115 and r = 0.320) with the larval population.

Key words : Population dynamics, abiotic factors, gram pod borer, *Helicoverpa armigera*.

How to cite : Nitish Kumar Alok, Sameer Kumar Singh and Umesh Chandra (2022) Population dynamics of gram pod borer, *Helicoverpa armigera* (Hübner) in relation to abiotic factors on chickpea. *J. Exp. Zool. India* **25**, 553-556. DocID: https://connectjournals.com/03895.2022.25.553

INTRODUCTION

The chickpea is the third most important crop after dry bean (*Phseolus vulgaris*) and pea (*Pisum sativum*). In India, chickpea is considered as King Pulses due to its high nutritional values and demand (Bhatt and Patel, 2001). It is a major supplement of protein (19g), calories 364 g), carbohydrate (61g), iron (34%), magnesium (28%) Vitamin B_6 (25%), vitamin C (6%) and contain various amino acids and medicinal properties (Anonymous, 2018) *i.e.* useful for stomach ailments, blood purifier and lowering of cholesterol (Bhargava, 2020). It has a high ability to fix more than 80 per cent atmospheric nitrogen in soil with help of symbiotic bacteria *Rhizobium* spp. (Baldev *et al*, 1998).

Globally, chickpea is grown about 10.70 million hectares with an average annual production of 9.00 metric tons. India leads the first rank in the area and production of chickpea. In India, chickpea occupies a 7.89-Million-hectare area and producing 7.06 Metric tons with 895 kg/ha productivity. Madhya Pradesh ranks highest in chickpea production (32.37%) followed by Rajasthan (19.46%), Maharashtra (15.82%), Andhra Pradesh (8.76%) and Uttar Pradesh (6.45%) these states contributing 82 per cent of the total production of the country. *Helicoverpa armigera* (Hübner) usually knows as gram pod borer, is one of the most important constraints of legume production. It has a wide host range due to its polyphagous nature and its feed on more than 250 crop species. The favourable weather conditions with frequent cloudy days during crop season that accounts for about 45 per cent to 95 per cent of damage caused by this pest (Sachan and Katti, 1994). Keeping these points in mind, above study was conducted to find the role of abiotic factors on the incidence of gram pod borer in chickpea.

MATERIALS AND METHODS

A field experiment was conducted at the Student's Instructional Farm (SIF), Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during *Rabi* 2020-21 on chickpea variety PUSA-262. The estimation of *H. armigera* larvae population was done under field condition in the plot size kept 10×10m with border 0.75m and row to row spacing kept 30cm and plant to plant spacing kept 10cm. The

The Pharma Innovation Journal 2022; SP-11(3): 1260-1267

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(3): 1260-1267
© 2022 TPI
www.thepharmajournal.com
Received: 21-01-2022
Accepted: 10-03-2022

Rama Shankar Yadav
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Vishal Mehta
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Ashish Tiwari
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Vishal Mehta
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

An application of time series ARIMA forecasting model for predicting nutri cereals area in India

Rama Shankar Yadav, Vishal Mehta and Ashish Tiwari

Abstract
This study employed a time series modeling method (Box-Jenkins' ARIMA model) to anticipate nutri cereals area in India. The optimal ARIMA model arrangement was shown to be (0,1,1). Furthermore, by applying the ARIMA (0,1,1) model to our time series data, we attempted to anticipate the future nutri cereals Area as accurately as possible for a period up to ten years. The yearly nutri cereals Area, according to the anticipated results. It will continue to fall at a pace of about 1% each year on average.

Keywords: Forecasting, time series modeling, ARIMA, nutri cereals area

1. Introduction
India, known as the original home of nutri cereals, Minor millets (Nutri cereals) are the groups of small seeded cereals and belong to the family of *Poaceae*, which are highly drought tolerant and other extreme weather conditions and are grown with low inputs of chemical such as fertilizers and pesticides. In small millets there are up to Thirty five species of grasses from twenty genera. Millets are one of the oldest cultivated foods, grown and consumed from the past more than 5000 years. Which are highly nutritious? They are provided nearly all of the essential nutrients for normal functioning of human body. Millets are good for people who are gluten-intolerant because millets are Gluten free and non- allergenic.
Millets are a kind of cereal grain. Millets such as Sorghum (Jowar), Pearl Millet (Bajra), Finger Millet (Ragi/Mandua), Minor Millets such as Foxtail Millet (Kanngani/kakun), Kodo Millet (Kodo), Proso Millet (Cheena), Little Millet (Kutki), Barnyard Millet (Sawa/Sanwa/Jhangora), Brown top millet.
In this paper, an effort is made to forecast nutri cereals Area for the 10 leading years. The model developed for forecasting is an Autoregressive Integrated Moving Average (ARIMA) model. This model was introduced by Box and Jenkins in 1960 and hence this model is also known as Box-Jenkins Model which is used to forecast a single variable. The main reason of choosing ARIMA model in this study for the forecasting is because this model assumes and takes into account the non-zero autocorrelation between the successive values of the time series data.
For this investigation, the open source statistical programme 'R' (build 4.0.5) was utilised, as well as numerous statistical and time series packages such as 'tseries' version: 0.10-48, 'predict', and 'TTR', among others.

Table 1: Yearly data of nutri cereals area Area - Million Hectares

Year	Area	Year	Area	Year	Area	Year	Area
1951	37.67	1969	46.24	1987	39.74	2005	29.03
1952	38.88	1970	47.24	1988	36.55	2006	29.06
1953	42.45	1971	45.95	1989	38.68	2007	28.71
1954	45.37	1972	43.57	1990	37.69	2008	28.48
1955	43.92	1973	42.21	1991	36.32	2009	27.45
1956	43.45	1974	46.24	1992	33.42	2010	27.68
1957	42.02	1975	43.15	1993	34.42	2011	28.34
1958	42.91	1976	43.8	1994	32.82	2012	26.42
1959	44.66	1977	41.94	1995	32.17	2013	24.76
1960	43.79	1978	42.28	1996	30.88	2014	25.22
1961	44.96	1979	42.23	1997	31.81	2015	25.17
1962	44.73	1980	41.36	1998	31.05	2016	24.39
1963	44.29	1981	41.78	1999	29.34	2017	25.01
1964	43.93	1982	42.45	2000	29.34	2018	24.29
1965	44.35	1983	40.43	2001	30.26	2019	22.15
1966	44.34	1984	41.71	2002	29.52	2020	24.02
1967	45.09	1985	39.21	2003	26.99		
1968	47.34	1986	39.47	2004	30.8		

Source of Data: Directorate of Economics & Statistics, DAC&FW, New Delhi

The Pharma Innovation Journal 2022; SP-11(3): 1254-1259

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(3): 1254-1259
© 2022 TPI
www.thepharmajournal.com
Received: 19-01-2022
Accepted: 10-03-2022

Manish Chouhan
School of Studies in Statistics, Vikram University, Ujjain, Madhya Pradesh, India

Vishal Mehta
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Tailor
School of Studies in Statistics, Vikram University, Ujjain, Madhya Pradesh, India

Ramkrishna S Solanki
College of Agriculture, Waraseoni (Balaghat), Madhya Pradesh, India

Annu
Department of Basic and Social Sciences, College of Forestry, Banda University of Agriculture and Technology, Banda, Uttar Pradesh, India

Ajay Kumar Gautam
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Vishal Mehta
Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India

Use of double sampling to estimate the finite population mean

Manish Chouhan, Vishal Mehta, Rajesh Tailor, Ramkrishna S Solanki, Annu and Ajay Kumar Gautam

Abstract
We have discussed the topic of estimating the finite population mean in double sampling in this paper. In this article, Singh and Tailor (2005) propose a ratio-cum-product type estimator for double sampling. Up to the first degree of approximation, biases and mean squared errors (MSEs) were determined. Existing estimators have been compared to the recommended estimators. An empirical research was carried out to assess how well the recommended estimators performed.

Keywords: Population mean, ratio-cum-product type estimator, correlation coefficient, bias, mean squared error

Introduction

The finite population mean of the auxiliary variate is assumed by ratio, product, and regression type estimators, however in many actual circumstances, the population mean of the auxiliary variate is known in advance. As a result, double sampling is used. A large sample is chosen to estimate the population mean of the auxiliary variate, and then a subsample is drawn from the large sample or independently from the population in double sampling.

Singh (1967) [3] proposed a ratio-cum-product estimator for population mean using the population mean of two auxiliary variates. Singh and Tailor (2005) [6] proposed a ratio-cum-product estimator for the population mean in simple random sampling based on the correlation coefficient between two auxiliary variables. Tailor and Sharma (2013) [4] proposed a coefficient of kurtosis-based ratio-cum-product estimator of population mean. Sharma *et al.* (2014) [5] proposed a generalised product approach for population mean estimation in two-phase sampling. The ratio-cum-product estimator of Singh and Tailor (2005) [6] is examined in double sampling in this study.

Consider a population $U = \{U_1, U_2, U_3, \ldots, U_N\}$ with a finite size$N$. Let y be the study variable, and x and z be the auxiliary variables, so that x is positively associated with the study variate y and z is negatively correlated with it.

For estimating the population mean $\bar{Y}$ in simple random sampling, Cochran (1940) [1] defined the classical ratio estimator as

$$\hat{\bar{Y}}_R = \bar{y}\left(\frac{\bar{X}}{\bar{x}}\right). \quad (1.1)$$

Robson (1957) [2] proposed using a product estimator to estimate the population mean $\bar{Y}$ as

$$\hat{\bar{Y}}_P = \bar{y}\left(\frac{\bar{z}}{\bar{Z}}\right). \quad (1.2)$$

Singh and Tailor (2003) [7] used the correlation coefficient between the study variable and the auxiliary variate as well as recommended ratio and product type estimators for the population mean $\bar{Y}$ in their analysis as

$$\hat{\bar{Y}}_{STR} = \bar{y}\left(\frac{\bar{X}+\rho_{yx}}{\bar{x}+\rho_{yx}}\right), \quad (1.3)$$

And

$$\hat{\bar{Y}}_{STP} = \bar{y}\left(\frac{\bar{z}+\rho_{yz}}{\bar{Z}+\rho_{yz}}\right), \quad (1.4)$$

Current Journal of Applied Science and Technology

40(3): 33-40, 2021; Article no.CJAST.65930
ISSN: 2457-1024
(Past name: British Journal of Applied Science & Technology, Past ISSN: 2231-0843, NLM ID: 101664541)

Determinants of Fallow Land in Different Districts of Madhya Pradesh

Rajendra Singh Bareliya[1*], Satyendra S. Thakur[1], H. O. Sharma[1], P. R. Pandey[1] and Vishal Mehta[2]

[1]Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur 482004 (MP), Agro-Economic Research Centre for M. P. and CG, Jabalpur, M.P., India.
[2]Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUAT), Kumarganj, Ayodhya, Uttar Pradesh, India.

Authors' contributions

This work was carried out in collaboration among all authors. Author RJB designed the study, performed the statistical analysis. Author SST wrote the protocol and authors HOS and PRP managed the analyses of the study. Author VM wrote the first draft of the manuscript managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI:10.9734/CJAST/2021/v40i331282
Editor(s):
(1) Dr. Nhamo Nhamo, Zimbabwe Open University, Zimbabwe.
Reviewers:
(1) Alexander Kasyoki Muoka, Taita Taveta University, Kenya.
(2) Udokang Anietie Edem, The Federal Polytechnic Offa, Nigeria.
(3) MD. Hasan Uj Jaman, Innovative Agricultural Initiatives (IAI), Bangladesh.
Complete Peer review History: http://www.sdiarticle4.com/review-history/65930

Original Research Article

Received 07 January 2021
Accepted 10 March 2021
Published 22 March 2021

ABSTRACT

The research study based on time series secondary data (2001-02 to 2015-16) of 51 district which were related to net area sown, rainfall, total fallow land, area under non agricultural uses and net irrigated area. The whole Madhya Pradesh was subdivided into two head i.e. major (14) and other fallow land (37) districts for the study. The area under fallow land showed decreasing trend by -19.26 percent from 601.90 thousand ha (The base year) to 485.99 thousand ha (The current year) with fluctuation of 9.94 percent (56.80 thousand ha) and magnitude of -8.97 thousand ha per year this also showed a negative compound growth of 0.98 percent per year during the period under study. The 1.00 per cent increase in net area irrigated to net area sown resulting highly significant decrease in share of total fallow land to total net sown area by 0.27 per cent. The aim of study was find out the fallow land in various districts of Madhya Pradesh.

**Corresponding author: E-mail: bareliyarajendra1m@gmail.com;*

Economic Affairs, Vol. 66, No. 3, pp. 377-382, September 2021
DOI: 10.46852/0424-2513.3.2021.3

AESSRA

Research Paper

Growth Rate of Pulses in Eastern Uttar Pradesh a Zone-wise Analysis

Ekta Pandey[1], Supriya[2], P. Mishra[3*], Vishal Mehta[1], Kadir Karakaya[4] and Mostafa Abotaleb[5]

[1]Department of Agricultural Statistics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUA & T), Kumarganj, Ayodhya, Uttar Pradesh, India
[2]Department of Agricultural Economics, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology (ANDUA & T), Kumarganj, Ayodhya, Uttar Pradesh, India
[3]College of Agriculture, Powarkheda, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Madhya Pradesh, India
[4]Selçuk University, Faculty of Science, Department of Statistics, Konya, Turkey
[5]Department of System Programming, South Ural State University, Chelyabinsk, Russia

*Corresponding author: pradeepjnkvv@gmail.com (**ORCID ID:** 0000-0003-4430-886X)

Received: 20-04-2021 **Revised:** 25-07-2021 **Accepted:** 05-08-2021

ABSTRACT

Attempts are made in this paper to investigate the trend of pulses in Eastern Uttar Pradesh, as well as their instability and non-linear model. This time series data on pulses pertains to the period 1980-1981 to 2014-15 and includes information on the area, production, and productivity of pulses. Pulses have had negative growth in terms of area, production, and productivity in all three zones of Eastern Uttar Pradesh, namely, the North Eastern plain zone, the Eastern plain zone, and the Vindhyan zone. Since 1980-81, there has been a rise in the area and output of pulses in the Vindhyan zone, as seen by the percentage change. The Eastern plain zone has the most stable pulse crop in terms of instability.

Highlights

- Zone wise study of growth rates of pulses crops helps in agricultural planning and determining agricultural operation at the state level to meet rising food and nutritional security.

Keywords: Growth, trend, linear growth rate (LGR), Instability index, non- linear regression

Pulses belong to the Fabaceae or Leguminos as family and are the third largest flowering clusters in the world. Since the dawn of the farming of the principal plants in the globe, people have grown pulses to be domesticated. Pulses are a vital constituent of the super molecule in the diet of an overwhelming majority of the poor and eating in Asia (Devi *et al*. 2021). In addition to grains, pulses offer a great blend of eater super high biological value molecules. Asian countries continue to be home to the precious gold of the world's ill-fed people. Asian countries are the largest producers, businessmen and buyers of pulses, representing twenty fifths of world production in thirty-fifths of the world's space Vishwajith *et al*. (2014). About 15.2 percent of people in Asian squares are poorly fed. This shows the importance of food and nutrition pulses for Indians (Vani and Mishra, 2019). Pulses are produced mostly in Asian countries, particularly in the Indian subcontinent. Various pulse crops are large measured in the Asiatic country in a wide variety of agro-climatic circumstances therefore it is a major global pulse participant. Pulses do not encompass crops which square measure

How to cite this article: Pandey, E., Supriya, Mishra, P., Mehta, V., Karakaya, K. and Abotaleb, M. (2021). Growth Rate of Pulses in Eastern Uttar Pradesh a Zone-wise Analysis. *Economic Affairs*, **66**(3): 377-382.

Source of Support: None; **Conflict of Interest:** None

Airtel 4G 4:47 PM 23%
Back 10-12-236-408.pdf

The Pharma Innovation Journal 2021; 10(12): 1263-1265

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(12): 1263-1265
© 2021 TPI
www.thepharmajournal.com
Received: 10-10-2021
Accepted: 16-11-2021

Dev Narayan Yadav
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Robin Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Amar Kant Verma
Department of Soil Conservation and Water Management, C. S. A. University of Agriculture and technology, Kanpur, Uttar Pradesh, India

Pardeep Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Robin Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of foliar application of nano-fertilizers on soil health and productivity in transplanted rice (*Oryza sativa* L.)

Dev Narayan Yadav, Robin Kumar, Amar Kant Verma and Pardeep Kumar

Abstract
A field experiment was conducted during *Kharif* season of 2019-20 at Main Experimental Station of Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). The experiment consisted 6 treatment *viz.* T_1: Control, T_2: 100% NPK & 100% Zinc application (RDF),T_3: 50% N; 100% P & K + 2 spray of Nano Nitrogen, T_4: 0% Zn, 100% NPK + 2 spray of Nano Zinc, T_5: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn and T_6: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn & Nano Cu in Randomized Block Design with 4 replication. The results of experimental revealed that the highest grain yield was recorded with T_6: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn & Nano Cu which was at par with T_5: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn and T_4: 0% Zn, 100% NPK + 2 spray of Nano Zinc. The highest gross return (Rs 119841 ha-1), net return (Rs. 64711 ha-1) and benefit cost ratio (2.17) as well was obtained T_6: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn & Nano Cu. The nitrogen(%), phosphorus(%), potassium(%), copper(%) and zinc(ppm) content in grain & straw are highest in grain & straw content was recorded under T_6: 50% N & 0% Zn; 100% P & K + 2 spray of Nano N mixed with Nano Zn & Nano Cu of central Uttar Pradesh.

Keywords: Seed yield, stover yield, harvest index, economics and uptake and content

Introduction

Rice (*Oryza sativa* L.) is one of the most important field crops after wheat in the world providing staple food to the millions. It is an indispensable source of calories for almost half of the population with in Asia. More than 90% of the world rice is produced and consumed in Asia, which is a native for 60% of the earth's population. Rice is the first most important crop in India where it is grown in an area of 43.79 million ha-1 with a total production of 112.91 million tones and an average productivity of 2578 kg ha-1 Singh *et al.,* (2020) [13]. The world Rice production was nearly 493.79 millions of tons in 2019-20. In May 2020 the United States Department of Agriculture (USDA) estimates that the World Rice Production 20-2021 will be 501.96 million metric tons. Rice Production last year was 493.79 million tons. This year's 501.96 estimated million tons could represent an increase of 8.17 million tons or 1.65% in Rice production around the Globe. Rice is one of the most important cereal crops consumed in Asian countries. 90% of world yields are grown and consumed in monsoonal Asia (East and South East Asia) where Rice is the staple because of its ability to tolerate excessive water conditions, both cold and warm climates. It has adjusted itself to cool, dry land conditions and Saline, Alkaline, and Acid sulphate Soils. India rank second among the top most Rice producers in the world after China. Global Rice production was only 495.9 million tons in (2018-19). In India total production of Rice during 2019-20 is estimated at record 117.47 million tones. It is higher by 9.67 million tones than the five years' average production of 107.80 million tons Anonymous, (2020) [1].

The nano-fertilizers or nano encapsulated nutrients might have the properties that are effective to crops, release the nutrients on demand, controlled release of chemical fertilizers that regulate the plant growth and enhanced target activity De Rosa *et al.* (2010) [2]. Effective application of nano-materials as fertilizer has been noticed. The most notable use of nano-fertilizers in crop production makes very innovative and effective initiation to boost the agricultural yields Raliya and Tarafdar (2013) [9]. As an alternative for conventional mode of fertilizer, nano-fertilizers provides a new way for the release of nutrients into the soil by the slow and controlled way, thus minimizing Eutrophication and water pollution Naderi and Abedi, (2012) [7].

Airtel 4G 4:47 PM 23%
Back 10-12-440-690.pdf

The Pharma Innovation Journal 2021; 10(12): 2792-2794

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(12): 2792-2794
© 2021 TPI
www.thepharmajournal.com
Received: 01-09-2021
Accepted: 08-10-2021

Pardeep Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Robin Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Dev Narayan Yadav
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Pardeep Kumar
Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Economic feasibility of organic manure-based treatments on crop performance in mustard, *Brassica juncea* (L.)

Pardeep Kumar, Robin Kumar and Dev Narayan Yadav

Abstract
Economics of Agriculture had direct impact on GDP of agri-based countries upto a large extent. The present study on field experiment was conducted during Rabi season on economic feasibility of mustard crop in 2020-2021. The experiment was laid with eight treatments and three replications in randomized block design. The result invoked that the cost of cultivation worth Rs. 49015 with gross income Rs. 131490 and net income costs Rs. 79640 per hectare in T5 (50% farm yard manure + 50% vermicompost + Natural liquid manure Jeevamrit). Which is at par with T6 (50% farm yard manure + 50% poultry manure + Natural liquid manure Jeevamrit) Whose cultivation cost Rs. 47980 with gross income Rs. 128655 and net income Rs. 61290 per hectare. Mathematically, the B: C Ratio of T5 (50% farm yard manure + 50% vermicompost + Natural liquid manure Jeevamrit) and T6 (50% farm yard manure + 50% poultry manure + Natural liquid manure Jeevamrit) treated plot was 1.62 and 1.59 respectively with with CD and SEM (+) revealed 0.15 and .05 respectively. Thus, application of T5 (50% farm yard manure + 50% vermicompost + Natural liquid manure Jeevamrit) was out yielded whereas T6 (50% farm yard manure + 50% poultry manure + Natural liquid manure Jeevamrit) was economically feasible for the mustard cultivation

Keywords: Mustard, FYM, vermicompost, poultry manure, Jeevamrit, gross & net income

Introduction
India is fourth largest producer of oilseeds accounting for about 20% of the global area and 10% of the globle production. In terms of acreage, production and economic value, oilseeds are second only to food grains. Oilseed cultivation is undertaken across the country in about 27.04 million ha, largely under rained areas covering 72% and producing around 33.42 million tonnes of oilseeds during 2019-2020. Nine oilseeds are the major source of vegetable oil in the country. Among nine major oilseed soybean (33.5%), groundnut (30%), and rapeseed & mustard (27%), contribute more than 90% of total oilseeds production in the country. However in terms of vegetable oil production of mustard, soybean and groundnut contribute 27%, 34%, 30% respectively. The area and production of oilseeds is concentrated in the central and south part of India mainly in the state of Madhya Pradesh (27.89%), Rajasthan (21.49%), Maharashtra (14.84%), Gujarat, Andhra Pradesh and Karnataka. Central organization for oil industry and trade (COOIT) has estimated 89.5 lakh tonnes of mustard seed to be produced in the country in the ongoing Rabi season of 2021-2022 against 75 lakh tonnes recorded last year, which brings a growth of about 19% over last year. Due to the gap between domestic availability and actual consumption of edible oils, India has to resort to import of edible oils. Organic manures are being widely used these days in the cultivation of mustard. Rapeseed-mustard is considered as major source of income especially even to the marginal and small farmers. Organic manures have a balanced role in production efficiency of mustard. Organic manures when combinely used with inorganic fertilizers produces a good yield compared to conventional nutrient application of farming (Srikanth *et al.* 2020).

Materials and Methods
The field experiment was conducted during Rabi season 2020-2021 at student instructional farm of A.N.D.U.A & T kumarganj, Ayodhya (U.P). It is situated on Ayodhya-Raibarelly road about 42 km. Away from Ayodhya head quarter at 26˚47′ N latitude and 82˚12′ E longitude and at an altitude of about 113 meter above the mean sea level. The field was well leveled having assured irrigation and drainage facilities. All the required materials and facilities necessary for the cultivation are readily available in the Department.

Disease Note

Diseases Caused by Bacteria and Phytoplasmas

First Report on Clover Proliferation Phytoplasma Related Strain Associated with *Matthiola incana* Floral Virescence in Uttar Pradesh, India

Priyam Panda,[1] Jay Kumar Yadav,[2] Sushil Kumar Singh,[2] Amrita Nigam,[1] and G. P. Rao[3,†]

[1] Discipline of Life Sciences, Indira Gandhi National Open University, New Delhi 110068, India
[2] Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224229, India
[3] Division of Plant Pathology, Indian Agricultural Research Institute, New Delhi 110012, India

Plant Dis. 0:1, 2021; published online as https://doi.org/10.1094/PDIS-10-20-2188-PDN. Accepted for publication 14 December 2020.

Matthiola incana (L.) R. Br (family Brassicaceae) is an ornamental commonly known as hoary stock and has extremely fragrant flowers, which bloom in dense clusters in a large variety of colors. During a survey of flower nurseries in March 2019 at the Indian Institute of Sugarcane Research campus, Lucknow, flower virescence (MiV) symptoms were observed in *M. incana* pots with an incidence of over 40%. Leaf yellows symptoms were also observed on a weed, *Acalypha indica* (AiLY), in the *Matthiola* nursery. Nested PCR assays were carried out to detect and identify the possible association of phytoplasmas with MiV and AiLY symptoms. Symptomatic MiV and AiLY samples and nonsymptomatic samples were collected and processed for DNA extraction from the leaf midrib by the CTAB method. *Hishimonus phycitis* (HP) (Hemiptera: Cicadellidae) leafhoppers feeding on MiV symptomatic plants were also collected and DNA extracted. The DNA of eight symptomatic and four nonsymptomatic plants and from the 10 leafhoppers was used as a template for PCR assays. Phytoplasma specific primers for the 16S rRNA gene (P1/P7 and 3Fwd/3Rev; Schneider et al. 1995; Manimekalai et al. 2010) and multilocus gene specific primer pairs for *secA* (SecAfor1/SecArev3; SecAfo5r/SecARev2; Bekele et al. 2011), *secY* (SecYF1(VI)/SecYR1(VI); SecYF2(VI)/SecYR1(VI); Lee et al. 2010), and *rp* genes (rpFIC/rp(I)R1A; rp(VI)F2/rp(VI)R2; Martini et al. 2007) were employed as previously described. Amplified products of ~1.3 kb, ~600 bp, ~1.7 kb, and ~1.0 kb of 16S rRNA, *secA*, *secY*, and *rp* genes of phytoplasma were consistently amplified in all the MiV and AiLY samples and in the HP leafhopper. No amplifications were achieved in any of the asymptomatic plant samples. Amplified products of all the four genes of MiV, AiLY, and HP isolates were purified, sequenced, and submitted in GenBank. Sequence comparison and phylogeny analysis of the sequences of the four genes of MiV, AiLY, and HP isolates revealed 99 to 100% sequence identity and clustering with clover proliferation phytoplasma related strains (16SrVI group). The virtual restriction fragment length polymorphism analysis with 17 restriction endonucleases corresponding to the 16S rRNA gene sequences of MiV, AiLY, and HP phytoplasma strains by pDraw program assigned them into a novel phytoplasma subgroup strain under 16SrVI group. Because its *Hpa*II restriction profile was different from earlier classified 16SrVI subgroups but was very close to 16SrVI-E (GenBank accession no. AY270156). Earlier, peanut witches' broom (16SrII-A) phytoplasma was identified associated with *M. incana* from Italy (Davino et al. 2007). However, the association of clover proliferation phytoplasma (16SrVI) related strain associated with virescence symptom of *M. incana* is the first report in world. The weed (*A. indica*) and HP leafhopper were also reported as additional host and putative vector of the 16SrVI subgroup related new strain in India, which needs further investigation. The report of a new host and new subgroup of clover proliferation phytoplasma related strain in India has an epidemiological significance and warrants attention.

References:

Bekele, B., et al. 2011. Bull. Insectol. 64:15.
Davino, S., et al. 2007. Bull. Insectol. 60:279.
Lee, I. M., et al. 2010. Int. J. Syst. Evol. Microbiol. 60:2887.
Manimekalai, R., et al. 2010. Plant Dis. 94:636.
Martini, M., et al. 2007. Int. J. Syst. Evol. Microbiol. 57:2037.
Schneider, B., et al. 1995. Mol. Diag. Proced. Mycoplasmol. 1:369.

The author(s) declare no conflict of interest.

e-Xtra

Keywords: hoary stock, *Acalypha indica*, 16SrVI group, 16S rRNA gene, *secA* gene, *rp* gene, *secY* gene

†indicates the corresponding author.
G. P. Rao; gprao_gor@rediffmail.com

Indian Phytopathology
https://doi.org/10.1007/s42360-018-0029-8

SHORT COMMUNICATION

Evaluation of *Aloe vera* genotypes against leaf rot disease under field condition

Susheel Kumar[1] · S. K. Pande[1] · S. K. Singh[1] · Jay Kumar Yadav[1] · Rajesh Saini[1]

© The Author(s) 2018

Abstract
Aloe vera (*Aloe barbadensis*) is a perennial, succulent plant belongs to the family Liliaceae. *Aloe vera* leaf rot is one of the major limiting factors in *Aloe vera* production, which decreases leaf, gel quantity and quality significantly. The experiment was conducted to evaluate the genotypes of *Aloe vera* against leaf rot disease Out of 26 genotypes, none of genotypes was found the free from disease, three genotypes viz, IC-111280, IC-112531 and IC-112513 were highly resistant, four genotypes viz., IC-111279,IC-112518, IC-285626 and IC-283655 were resistant, nine genotypes viz, IC-310618, IC-471886, IC-310904, IC-112569, IC-112519, IC-112532, IC-310611, IC-310617 and IC-310596 were moderately resistant and rest of the genotype were moderately susceptible to highly susceptible against the disease.

Keywords *Fusarium oxysporum* · Genotypes · Leaf rot · Screening

Aloe vera (*Aloe barbadensis* Miller) is a perennial, drought resisting succulent plant belong to the family Liliaceae which its believed to have originated in African continent specifically in Egypt (Daodu 2000). There are over 250 species of *A. vera* growing around the world however, only *A. barbadensis*, *A. ferox* and *A. arborescence* are used as herbal drugs. *Aloe vera* is grown largely in South America, Central America, Australia and Africa. *Aloe vera* is cultivated in fairly large area in many in parts of India. *A. barbadensis* which revealed three types of leaf spots and root rot disease (Sharma and Samota 2007). A stabilized product is incorporated in a wide variety of preparation, including juice, gel, ointments, cream, lotion and shampoos (Daodu 2000). The leaf yield varied from 0.599 to 2.922 kg per plant per year due to disease in different genotypes (Abhila and Jessyeutty 2010). The gel/juice is consumed directly and used in many preparations therefore it is necessary to raise plant without use of chemicals. Management of leaf rot disease of *Aloe vera* is mainly achieved through the use of chemicals. Use of fungicides has led to the emergence of several problems like enviremental pollution, residual effect, killing of benifecial organisms and devlopment of resistant in pathogen. Therefore, cultivation of resistant genotypes of *Aloe vera* is one of the desirable management options, but their long term stability virtue of true resistance are need for their confirmation under field condition because the role are mineral metabolism and total soluble phenol an imparting resistance/susceptibility against fungus diseases of plant has been also infested (Ashfaq et al. 2014a, b). The leaf rot resistant genotypes under open field condition have been reported by Kumar (2008). However, very limited information is available on the sources of resistance against leaf rot disease in *Aloe vera*. In view of the importance of *Aloe vera* in Indian agriculture, some *Aloe vera* genotypes were evaluated against leaf rot caused by *F. oxysporum*.

The experiment was conducted during *Kharif* season 2014 and 2015 at experimental farm of Medicinal and Aromatic Plant at N.D. University of Agriculture & Technology, Kumarganj, Faizabad. Twenty-six Aloe germplasm/cultivars were screened against *F. oxysporum*. The old suckers were transplanted in second week of July at a spacing of 50×40 cm in augmented design under field condition for evaluation of their resistance against leaf rot of *Aloe vera*. Three rows of Aloe leaf rot susceptible cultivar IC-471882 (Check) were planted. Recommended package of cultural practices was followed to raise the crop and to promote natural infection. Ten plants in each plot were randomly selected and tagged for visual observations on symptoms appearance

✉ Susheel Kumar
susheel8263@gmail.com

[1] Department of Plant Pathology, N.D. University of Agricultural and Technology, Kumarganj, Faizabad, Uttar Pradesh 224 229, India

Published online: 27 June 2018

Research Article *Ann. Pl. Protec. Sci.* **29** (3) : 241-245 (November, 2021)

doi: 10.5958/0974-0163.2021.00052.5

Efficacy of *Trichoderma viride* and *T. harzianum* culture filtrate on egg hatching and larval mortality of root-knot nematode, *Meloidogyne incognita*

Shyam Babu Gautam, Ramesh Chand, Sushil K. Singh, Subhash Chandra and Manish K. Maurya

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya – 224 229 (U.P.), India
<kardam.nd@rediffmail.com>

Date of Receipt: 26.08.2021; Accepted: 27.09.2021

ABSTRACT

The results revealed that egg hatching and larval mortality of *Meloidogyne incognita* in culture filtrate of *Trichoderma viride* and *Trichoderma harzianum* increased with the increase in the concentration of culture filtrate and time duration. The egg hatching in *Trichoderma viride* culture filtrate was highest (100.00) in the 5.0% concentration followed by 89.00, 81.50, 72.50, 66.25, 56.75, 53.50, 42.25 and 34.00 at 36 hours and 169.50, 154.25, 142.00, 128.25, 121.25, 95.50, 75.25, 65.50, 42.25 at 72 hrs time duration time in 5, 10, 15, 20, 30, 40, 50, 75, 100% filtrate concentration, respectively. The larval mortality was observed highest 72.25% in 100% concentration of the culture filtrate followed by 4.00, 17.00, 22.00, 42.25, 47.50, 54.50, 63.00, 67.50, and 72.25% at 36 hrs interval and 13.75, 26.00, 41.25, 56.75, 59.75, 66.50, 72.00, 77.75 and 81.00% mortality at 72 hrs in 5, 10, 15, 20, 30, 40, 50, 75 and 100% concentration treatment. In *Trichoderma harzianum* culture filtrate was recorded highest (82.25) in the 5.0% concentration followed by 72.00, 67.50, 60.25, 54.50, 49.25, 40.75, 31.50 and 24.75 at 36 hrs and 148.00, 136.75, 126.50, 118.00, 99.25, 79.75, 65.50, 52.50, 31.25 at 72 hrs time duration time in 5, 10, 15, 20, 30, 40, 50, 75, 100% filtrate concentration, respectively. The larval mortality was observed highest 86.00% in 100% concentration of the culture filtrate followed by 6.25, 16.75, 23.50, 29.50, 48.75, 58.25, 64.50, 74.00, and 86.00% at 36 hrs interval and 13.25, 32.00, 47.75, 53.50, 64.00, 69.50, 76.25, 84.75 and 93.50% mortality at 72 hrs in 5, 10, 15, 20, 30, 40, 50, 75 and 100% concentration treatment. The % reduction in egg hatching when eggs were exposed to the culture filtrate of *Trichoderma viride* and *Trichoderma harzianum* in comparison to the control was recorded 26.72, 35.85, 39.86, 46.32, 51.44, 56.12, 63.69, 71.93 and 77.95 at 36 hrs and 12.81, 19.44, 25.47, 30.48, 41.53, 53.01, 61.41, 69.07 and 81.59 at 72 hrs exposer time in *T. harzianum* culture filtrate on the other hand in *T. viride* recorded 10.35, 24.73, 31.07, 38.68, 43.97, 52.00, 54.75, 35.72, 71.25 and 71.25 at 36 hrs and 3.00, 11.73, 18.74, 26.60, 30.61, 45.35, 56.93, 62.51 and 75.82 % at 72 hrs exposer period.

Key words: Filtrate on egg hatching, *Meloidogyne incognita*, *Trichoderma* spp.

Nematode diseases are known to be one of the most widespread in the last two decades that attract the attention of researchers, especially those in the field of the plant protection, there are thousands of genus and species of plant parasitic nematodes, which cause damage in quality and quantity of the yield in varied crops; moreover, increasing the costs of production. The most famous and destructive genus around the world is the root-knot nematode, *Meloidogyne incognita*, because of its wide host range which includes more than 2000 hosts, such as vegetables, fruit trees, fiber, oil seeds, grain and

International Journal of Scientific Research in Biological Sciences
Vol.8, Issue.2, pp.41-48, April (2021)

Research Paper

E-ISSN: 2347-7520

Integrated Disease Management Wilt of Lentil Caused by *Fusarium oxysporum* f. sp. *Lentis*

Khushboo Dubey[1]*, S.K. Singh[2]

[1,2]Dept. of Plant Pathology,A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya -224229, U.P., India

*Corresponding Author: khushbudubey89@gmail.com, Phone: +918127359929

Available online at: www.isroset.org

Received: 30/Mar/2021, Accepted: 08/Apr/2021, Online: 30/Apr/2021

Abstract- Effect of chemical, bio-agents and *Rhizobium* was tested alone and in combination to see their individual as well as combined effect on wilt disease management in pot under net house conditions. Eighteen treatments were under taken in this study, among them highest per cent disease control (70.89%) was recorded with *Rhizobium* (ST)+ Carbendazim.(ST)+ *Pseudomonas sp.*(SoilT) followed by *Rhizobium*(ST)+Carbendazim.(ST)+ *Bacillus subtilis* (SoilT) (67.05), *Rhizobium* (ST)+Carbendazim. (ST)+T.h. (64.64%), *Rhizobium*(ST) + soilT *T.harzianum* (63.36%), *Rhizobium*(ST) + Carbendazim. (ST) (59.47%), *Rhizobium*(ST) + *Pseudomonas fluorescens* (SoilT) (58.94%), *Rhizobium*(ST)+*Bacillus subtilis* (SoilT) (57.12%), *Rhizobium(ST)* + *T.harzianum*(SoilT) (56.66%), *Rhizobium*(ST) + *T.harzianum*(ST) (56.41%), Carbendazim.(ST) (52.48%), *Pseudomonas fluorescens* (SoilT) (49.92%), *Bacillus subtilis* (SoilT)(46.24%), *T. harzianum* (SoilT) (43.52%), *Pseudomonas fluorescens* (ST) (42.08%), *Bacillus subtilis* (ST) (39.04%), *T. harzianum*(ST) (35.89%) and *Rhizobium*(ST) (17.58%) as compared to untreated pots during 2016-17.

Keywords -Biocontrol agent, Fusarium, Lentil, rhizobium sp. and fungicides.

I. INTRODUCTION

Lentil (*Lens culinaris* Medik.) is one of the major grain legume crops and play very important role in the supply of the protein to under nourished vegetarian population of the country. It is mainly grown in North-Eastern plain zone as sole and intercrop under rain-fed conditions. It suffers from a number of diseases. Wilt of lentil caused by *Fusarium oxysporum f. sp. lentis* is one of the most wide spread and destructive disease where ever crop is grown. Lentil is cultivated as a rain fed crop in all India about 1.34 million ha area with 1.02mt production and 759 kg/ha productivity (**Abraham, 2015**). In India lentil is predominantly grown in the North, particularly in Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal. In Uttar Pradesh, it is grown in 620.000 lakh/ha area with 452.000lakh tones production and 732.0 kg/ha productivity (**Ahmad, *et al.*, 2018**).Many attempts have been made to control this disease using chemical, biological, varietal and cultural methods (**Ram and Pandey, 2011; Sinha and Sinha, 2004; Khan and Mehnaz, 2003; Srivastava *et al.*, 2000**). None of the control measures found to be effective individually at field level. Seed treatment with fungicide, *Rhizobium* and bio-agents are most commonly used methods are often used in integrated management. However, the present investigation deals with the integrated management of lentil wilt by integrating chemical, bioagents.

II. MATERIAL & METHODS

Experiment was conducted in pots under net house conditions with sterilized soil. Soil inoculated with *F. oxysporum* f.sp. *lentis* 5% inoculum Chemical, bio-agents and *Rhizobium* was tested alone and in combination to see their individual as well as combined effect on disease management. For seed treatment fungicide (carbendazim), bioagent (*T. harzianum*) and *Rhizobium,* integration of these treatments, the seed was first treated with carbendazim (0.2 per cent) followed by 24 hours later with *Trichoderma harzianum* (0.4 per cent) than *Rhizobium* (0.2 per cent) and soil treatment. The treated seeds was sown in the pots. The seed of lentil (susceptible variety- L 9-12) was sown in each pot (15 seed per pot) where finally 10 plants was maintained. The experiment was conducted in CRD with 18 treatments including control.

Treatment details:
Variety- L 9-12
Replication-3; Design-CRD; Treatments-18
T_1-Seed treatment with *Rhizobium leguminoserum*@0.2g/kg
T_2-Seed treatment with *Bacillus subtilis*. @10 g/kg
T_3- Seed treatment with *Trichoderma harzianum*@4g/kg

© 2021, IJSRBS All Rights Reserved

Disease Note

Diseases Caused by Bacteria and Phytoplasmas

First Report on Clover Proliferation Phytoplasma Related Strain Associated with *Matthiola incana* Floral Virescence in Uttar Pradesh, India

Priyam Panda,[1] Jay Kumar Yadav,[2] Sushil Kumar Singh,[2] Amrita Nigam,[1] and G. P. Rao[3,1]

[1]Discipline of Life Sciences, Indira Gandhi National Open University, New Delhi 110068, India
[2]Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224229, India
[3]Division of Plant Pathology, Indian Agricultural Research Institute, New Delhi 110012, India

Plant Dis. 0:1, 2021, published online as https://doi.org/10.1094/PDIS-10-20-2188-PDN. Accepted for publication 14 December 2020.

Matthiola incana (L.) R. Br. (family Brassicaceae) is an ornamental commonly known as hoary stock and has extremely fragrant flowers, which bloom in dense clusters in a large variety of colors. During a survey of flower nurseries in March 2019 at the Indian Institute of Sugarcane Research campus, Lucknow, flower virescence (MiV) symptoms were observed in *M. incana* pots with an incidence of over 40%. Leaf yellows symptoms were also observed on a weed, *Acalypha indica* (AiLY), in the *Matthiola* nursery. Nested PCR assays were carried out to detect and identify the possible association of phytoplasmas with MiV and AiLY symptoms. Symptomatic MiV and AiLY samples and nonsymptomatic samples were collected and processed for DNA extraction from the leaf midrib by the CTAB method. *Hishimonus phycitis* (HP) (Hemiptera: Cicadellidae) leafhoppers feeding on MiV symptomatic plants were also collected and DNA extracted. The DNA of eight symptomatic and four nonsymptomatic plants and from the 10 leafhoppers was used as a template for PCR assays. Phytoplasma specific primers for the 16S rRNA gene (P1/P7 and 3Fwd/3Rev; Schneider et al. 1995; Manimekalai et al. 2010) and multilocus gene specific primer pairs for *secA* (SecAfor1/SecArev3, SecAfo5r/SecARev2; Bekele et al. 2011), *secY* (SecYF1(VI)/SecYR1(VI), SecYF2(VI)/SecYR1(VI); Lee et al. 2010), and *rp* genes (rpFIC/rpDR1A, rpVDF2/rpVDR2; Martini et al. 2007) were employed as previously described. Amplified products of ~1.3 kb, ~600 bp, ~1.7 kb and ~1.0 kb of 16S rRNA, *secA*, *secY*, and *rp* genes of phytoplasma were consistently amplified in all the MiV and AiLY samples and in the HP leafhopper. No amplifications were achieved in any of the asymptomatic plant samples. Amplified products of all the four genes of MiV, AiLY, and HP isolates were purified, sequenced, and submitted in GenBank. Sequence comparison and phylogeny analysis of the sequences of the four genes of MiV, AiLY, and HP isolates revealed 99 to 100% sequence identity and clustering with clover proliferation phytoplasma related strains (16SrVI group). The virtual restriction fragment length polymorphism analysis with 17 restriction endonucleases corresponding to the 16S rRNA gene sequences of MiV, AiLY, and HP phytoplasma strains by pDraw program assigned them into a novel phytoplasma subgroup strain under 16SrVI group. Because its *Hpa*II restriction profile was different from earlier classified 16SrVI subgroups but was very close to 16SrVI-F (GenBank accession no. AY270156). Earlier, peanut witches' broom (16SrII-A) phytoplasma was identified associated with *M. incana* from Italy (Davino et al. 2007). However, the association of clover proliferation phytoplasma (16SrVI) related strain associated with virescence symptoms of *M. incana* is the first report in world. The weed (*A. indica*) and HP leafhopper were also reported as additional host and putative vector of the 16SrVI subgroup related new strain in India, which needs further investigation. The report of a new host and new subgroup of clover proliferation phytoplasma related strain in India has an epidemiological significance and warrants attention.

References

Bekele, B., et al. 2011. Bull. Insectol. 64:[illegible]
Davino, S., et al. 2007. Bull. Insectol. 60:[illegible]
Lee, I. M., et al. 2010. Int. J. Syst. Evol. Microbiol. 60:2887
Manimekalai, R., et al. 2010. Plant Dis. 94:636
Martini, M., et al. 2007. Int. J. Syst. Evol. Microbiol. 57:2037
Schneider, B., et al. 1995. Mol. Diag. Proced. Microphysiol. 1:369

The author(s) declare no conflict of interest.

e-Xtra

Keywords: hoary stock, *Acalypha indica*, 16SrVI group, 16S rRNA gene, *secA* gene, *rp* gene, *secY* gene

[1]Indicates the corresponding author.
G. P. Rao; gprao_gor@rediffmail.com

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 10 (2017) pp. 1319-1322
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.610.155

Integrated Management of Lentil Wilt Caused by *Fusarium oxysporum* f. sp. *lentis*

Sushil Kumar Singh[1], Adesh Kumar[2*], Bhanu Pratap Singh[1], Jay Kumar Yadav[1] and Khushboo Dubey[1]

[1]Department of Plant Pathology, N. D. University of Agriculture and Technology, Kumarganj, Faizabad 224229, U.P., India
[2]Plant Molecular Biology and Genetic Engineering, N. D. University of Agriculture and Technology, Kumarganj, Faizabad 224229, U.P., India
Corresponding author

Keywords
Lentil, Wilt, Integrated Management, *Fusarium oxysporum* f. sp. *lentis*, Bio-agent, Chemical.

Article Info
Accepted: 14 September 2017
Available Online: 10 October 2017

ABSTRACT

Field experiments were conducted in Faizabad during 2014-15 and 2015-16 cropping season to evaluate the effect of different control options (seed treatment with Carbendazim, *Trichoderma harzianum* and intercropping with linseed, alone and in combination) on lentil wilt caused by *Fusarium oxysporum* f. sp. *lentis*. The results indicated that seed treatment with *Trichoderma harzianum* (4g/kg seed) + Carbendazim (1g/kg seed) + intercropping with linseed (2:1 ratio) found minimum wilt incidence (11.67%), maximum disease control (72.06%) and higher yield (1291 kg/h) as compared to check having maximum wilt incidence (41.78%) and lowest yield (597 kg/h).

Introduction

Lentil (*Lens culinaris* Medik.) is one of the major grain legume crops and play very important role in the supply of the protein to under nourished vegetarian population of the country. It is mainly grown in North-Eastern plain zone as sole and intercrop under rain-fed conditions. It suffers from a number of diseases. Wilt of lentil caused by *Fusarium oxysporum f. sp. lentis* is one of the most wide spread and destructive disease where ever

Many attempts have been made to control this disease using chemical, biological, varietal and cultural methods (Ram and Pandey, 2011; Sinha and Sinha, 2004; Khan and Mehnaz, 2003; Srivastava *et al.*, 2000).

None of the control measures found to be effective individually at field level. Seed treatment with fungicide and bioagents is most commonly used methods and intercrop

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 3397-3399
Received: 01-05-2019
Accepted: 05-06-2019

Jay Kumar Yadav
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Singh
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Jay Kumar Yadav
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on survey of dry root rot of chickpea incidence in chickpea growing districts of Uttar Pradesh

Jay Kumar Yadav and SK Singh

Abstract
Chickpea (*Cicer arietinum* L.) Is an important pulse crop of India popularly known as Gram. Dry root rot of chickpea is the most severe disease in the central and southern zone, where the crop is mostly grown under rainfed condition. *Rhizoctonia bataticola* (Taub.) Butler is one of the most distructive pathogen causing dry root rot disease in chickpea. The survey studies indicated that overall dry root rot incidence compratively higher in Ayodhya districts (27.39%) grown chickpea crop, compared to other four districts (Basti, Gonda, Sultanpur and Kanpur). In five districts of Uttar Pradesh survey, the disease was found to be widely distributed and regular occurance with moderate to severe incidence and its, average both years (2017-18 and 2018-19) incidence was found maximum in the districts of Ayodhya (27.39%) followed by Kanpur (25.29%), Sultanpur (23.89%), Gonda (11.41) and Basti district (10.30%).

Keywords: Chickpea, survey, dry root rot, disease incidence and *Rhizoctonia*

Introduction
Chickpea (*Cicer arietinum* L.) Known by different names i.e Gram, Spanish pea, Chestnut bean (English), Poischiche (French), Homos (Arabic), Garbanzo (Spanish) and Chana (Hindi). Mainly two types of chickpea are grown, brown seeded types (Desi) and white seeded called "Kabuli" (Haware *et al.* 1986). Chickpea belongs to Leguminaceae family usually grown after rainy season on conserved soil moisture during winter in the tropics; in spring in the temperate and Mediterranean regions. The total world acreage under pulses is about 85.40 (Mha) with production of 87.40 (Mt) and 1023 kg/ha productivity. India, with >29 Mha pulses cultivation area, is the largest pulse producing country in the world. It ranks first in area and production with 34 per cent and 26 per cent respectively. During 2017-18 the country's productivity at 835 kg/ha, is a significant increase over Eleventh (662 kg/ha) and Twelfth plans (745 kg/ha). The area of Uttar Pradesh is 562 Th area with a production of 626.00 Tt and productivity of 1114 kg/ha (Anonymous, 2018)[1]. Dry root rot is one of the major production constraints that cause 10-20 per cent annual loss (Vishwadhar and Chaudhary, 2001)[14]. Dry root rot of chickpea is the most severe disease in the central and southern zone, where the crop is mostly grown under rainfed condition. *Rhizoctonia bataticola* (Taub.) Butler is one of the most distructive pathogen causing dry root rot disease in chickpea. Among the diseases of chickpea, dry root rot is emerging as the most destructive constraint to chickpea production, as the disease is more prevalent during hot temperature of 30 to 35°C and low soil moisture conditions (Taya *et al.*, 1988; Pande and Sharma, 2010)[13, 8]. Dry root rot caused by *Rhizoctonia bataticola* (Taub.) Butler [Pycnidial stage: *Macrophomina phaseolina* (Tassi) Goid] is a soil and seed borne necrotrophic fungal pathogen that has a global distribution. It can infect more than 284 plant species throughout the world including monocot and dicots (Farr *et al.*, 1995)[2].

Method and Materials
The survey for the occurrences and incidence of chickpea dry root rot was conducted during crop *Rabi* season 2017-18 and 2018-2019. Observation was recorded on farmer's field under natural conditions. The survey were conducted to record the occurrence and distribution of dry root rot of chickpea in 25 blocks of the five chickpea growing districts in Uttar Pradesh, India *viz.* Basti, Gonda, Faizabad, Sultanpur and Kanpur during Rabi 2017-18 and 2018-2019. The blocks and farmers field in each districts were selected randomly. The five blocks visited per district and a distance of 15 - 20 km. To assess the disease incidence, five to seven fields were observed in each blocks and average incidence of the disease in each blocks was calculated. During the survey disease incidence was recorded. Four 1m2 quadrants were randomly selected in each field and infected plants were counted in each quadrant. Based on infected and

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 3394-3396
Received: 05-05-2019
Accepted: 10-06-2019

Jay Kumar Yadav
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Singh
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Jay Kumar Yadav
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Efficacy of different soil amendment on disease incidence of dry root rot of chickpea during year 2017-2018

Jay Kumar Yadav and SK Singh

Abstract
Chickpea (*Cicer arietinum* L.) is an important pulse crop of India popularly known as Gram. Dry root rot of chickpea is the most severe disease in the central and southern zone, where the crop is mostly grown under rainfed condition. *Rhizoctonia bataticola* (Taub.) Butler is one of the most distructive pathogen causing dry root rot disease in chickpea. The efficacy of different soil amendment *viz.*, Neem oil cake, Mustard oil cake, Linseed oil cake, Saw dust and Parthinium were evaluated for the management of dry root rot disease of chickpea in pot condition during 2017-18. Among the amendment, Neem oil cake was found effective in reducing the disease incidence, delay the appearance of disease and increase in germination, fresh and dry plant weight, number of branches/plant, number of pods/plant, plant height(cm), test weight (100 seed) and yield (gm)/plant. Among the amendment Neem oil cake was found most effective which delayed appereance of symptoms till 110 days after sowing (DAS) and maximum seed germination (92.67%) as compared to control 85 DAS and seed germination (80.0%) during 2017-2018.

Keywords: Chickpea, soil amendment, dry root rot, disease incidence and *Rhizoctonia*

Introduction
Chickpea (*Cicer arietinum* L.) known by different names *i.e* Gram, Spanish pea, Chestnut bean (English), Poischiche (French), Homos (Arabic), Garbanzo (Spanish) and Chana (Hindi). Chickpea belongs to Leguminaceae family usually grown after rainy season on conserved soil moisture during winter in the tropics; in spring in the temperate and Mediterranean regions. The total world acreage under pulses is about 85.40 (Mha) with production of 87.40 (Mt) and 1023 kg/ha productivity. India, with >29 Mha pulses cultivation area, is the largest pulse producing country in the world. It ranks first in area and production with 34 per cent and 26 per cent respectively. During 2017-18 the country's productivity at 835 kg/ha, is a significant increase over Eleventh (662 kg/ha) and Twelfth plans (745 kg/ha). The area of Uttar Pradesh is 562 Th area with a production of 626.00 Tt and productivity of 1114 kg/ha (Anonymous, 2018) [1]. Dry root rot is one of the major production constraints that cause 10-20 per cent annual loss (Vishwadhar and Chaudhary, 2001) [12]. Dry root rot of chickpea is the most severe disease in the central and southern zone, where the crop is mostly grown under rainfed condition. *Rhizoctonia bataticola* (Taub.) Butler is one of the most distructive pathogen causing dry root rot disease in chickpea. Among the diseases of chickpea, dry root rot is emerging as the most destructive constraint to chickpea production, as the disease is more prevalent during hot temperature of 30 to 35 °C and low soil moisture conditions (Taya *et al.*, 1988; Pande and Sharma, 2010) [11, 7]. Dry root rot caused by *Rhizoctonia bataticola* (Taub.) Butler [Pycnidial stage: *Macrophomina phaseolina* (Tassi) Goid] is a soil and seed borne necrotrophic fungal pathogen that has a global distribution. It can infect more than 284 plant species throughout the world including monocot and dicots (Farr *et al.*, 1995) [2].

Method and Materials
Efficacy of different soil amendment on disease incidence was conducted during *Rabi* crop season 2017-18 in pot at net house of Department of Plant Pathology, College of Agriculture, N. D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.). An experiment was laid out in CRD with three replications and 6 treatments. Soil were collected and sterilized in autoclave, filled in earthen pots (kg/pots) separately. The sterilized earthen pots of 15 cm diameter were filled with sterilized soil. Neem cake (2.77gm./kg soil), mustard cake (2.53gm./kg soil), linseed oil cake (2.28gm./kg soil), sawdust (1.64gm./kg soil), and Parthinium compost (5gm./kg soil) were mixed individually in the sterilized soil filled pots, two weeks prior to sowing.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP2: 328-338

Utkarsh Singh Rathore
Division of Crop Protection, Indian Institute of Pulses Research, Kanpur, Uttar Pradesh, India

SK Singh
Department of Plant Pathology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, India

Sandeep Kumar
Division of Crop Protection, Indian Institute of Pulses Research, Kanpur, Uttar Pradesh, India

Saloni Rishi
Department of Microbiology, National Botanical Research Institute, Lucknow, Uttar Pradesh, India

Correspondence
Utkarsh Singh Rathore
Division of Crop Protection, Indian Institute of Pulses Research, Kanpur, Uttar Pradesh, India

National Conference on Conservation Agriculture
(ITM University, Gwalior on 22-23 February, 2018)

Application of botanicals for effective management of *Alternaria* blight of Pigeon pea

Utkarsh Singh Rathore, SK Singh, Sandeep Kumar and Saloni Rishi

Abstract
Pigeon pea (*Cajanus Cajan* L. Millsp.) is an important pulse crop of India and grown in *Kharif* seasons. *Alternaria* blight caused by *Alternaria tenuissima* is one of the most important disease of pre-rabi Pigeon pea. An inexpensive and environment friendly management regimen is required to minimize loss due to *A. temuissima*. The inhibitory effect of 17 botanicals were evaluated both *in vitro* and *in vivo* at 10 and 15 per cent concentration of plant extracts against *A. tenuissima*. The results showed that the effectiveness of extracts was directly proportional to their concentration. Among all plant extracts were neem showed maximum inhibition against *A. tenuissima* at 15% concentration after 7 days of incubation *in vitro* followed by Eucalyptus and Garlic. However, percent disease control in between Neem and Eucalyptus; Garlic and Mehandi; Ginger and Tulsi; Kaner and Onion; Lantana and Sadabahar; Bael and Bhang; Parthenium and Marigold were at par to each other.

Keywords: Pigeon pea, botanicals, percent disease control, *Alternaria tenuissima*

Introduction
The yield of Pigeon pea (699kg/ha) is much lower than potential yield of 2000 to 2500 kg/ha with improved varieties. The poor yield of Pigeon pea is mainly due to biotic stress like diseases and insect pests.

The crop is infected by 210 pathogens (83 fungi, 4 bacteria, 19 viruses and mycoplasma and 104 nematodes) reported from 58 countries. The maximum number has been reported from India with 98 pathogens (Nene *et al.*, 1996) but only few of them like wilt, sterility mosaic, phytophthora blight and *Alternaria* blight are major and destructive diseases.

Alternaria blight caused by *Alternaria tenuissima* is one of the most widespread and destructive foliar diseases of Rabi Pigeon pea. The disease was first described by Pavgi and Singh in 1971 followed by Kannaiyan and Nene in 1977-1980 crop season on September planted Pigeon pea cultivar (Bahar and Basant) in northern Indian staes of Uttar Pradesh and Bihar (Mehta and Sinha, 1982; Narula, 1983 and Venkateswarlu et al., 1981). The fungus causing leaf spot of Pigeon pea observed by Kannaiyan and Nene in year 1997 at ICRISAT, Hyderabad. The disease appeared in epiphyotic form on September planted Pigeon pea during February, 1980 in Muzzaffarpur district of Bihar and also in 1981 in Varanasi and other areas of eastern Uttar Pradesh. (Kannaiyan and Nene, 1977).

The incidence varied from 18.0% to 37.5% in different locations of Central Uttar Pradesh. (Kushwaha *et al.*, 2010). Hence, for minimizing the losses caused by *Alternaria* blight need inexpensive and environmentally safe management practices.

It was, therefore considered desirable to disease management through botanicals with the following objectives:

1. Efficacy of botanical against *A.tenuissima in vitro* and
2. Efficacy of botanical against *A.tenuissima in vivo*.

2. Materials and Methods
The present studies were carried out in the laboratory and glass house of the Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.). The details of materials used, experimental procedures followed and techniques adopted are given as under:

Int.J.Curr.Microbiol.App.Sci (2018) 7(9): xx-xx

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 09 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.708.xx

Study Cultural, Morphological and Pathogenic Variation among Different Isolates of *Fusarium oxysporum* f. sp. *lentis*

Khushboo Dubey and Sushil Kumar Singh

Department of Plant Pathology, N. D. University of Agriculture and Technology, Kumarganj, Faizabad -224229, U.P., India

**Corresponding author*

Keywords

Cultural, Morphological, Pathogenic variability, *Fusarium*, lentil

Article Info

Accepted:
xx August 2018
Available Online:
xx September 2018

A B S T R A C T

Lentil (*Lens culinaris* Medik.), one of the major pulses cultivated and consumed in India, is also known as Masur It has a high nutritive value and major source of dietary proteins (25%) after soybeans in human and animal diet. *Fusarium* wilt of lentil caused by *Fusarium oxysporum* f.sp. *lentis* is the most serious disease of lentil. Ten isolates of *F. oxysporum* f.sp. *lentis* were studied for its cultural, morphological and pathogenic variability. Pigmentation is varied among the isolates. Out of 10 isolates, 4 isolates FOL-R3, FOL-V8, FOL-M6 and FOL-R9 were Purple, were dull yellowish, isolates FOL- B7, and FOL-S10, four isolates like FOL-A2, FOL-L4, FOL-S5 and FOL-S10 were white FOL-F1was light puff in coloure. The size of microconidia varied between7.30×3.43 (FOL-L4) to 13.25 x 2.68µm (FOL-S10) and macroconidia varied from 24.11×4.67 (FOL-A2) to 40.05 x 4.71µm (FOL-V8). The number of septa in macro-conidia was mostly 3-6 and micro-conidia are mostly no septum and some are 0-1. Chlamydospore are terminal and intercalary. Pathogenic variability revealed that most of the isolates were highly pathogenic.

Introduction

Lentil (*Lens culinaris* Medik.), is a member of Leguminaceae family and it is commonly known as masoor or poor man's meat. It has a high nutritive value and major source of dietary proteins (25%) after soybeans in human and animal diet (Rahman *et al.,* 2010). It is cultivated as a rain fed crop in all India about 1.34 million ha area with 1.02mt production and 759 kg/ha productivity (Abraham, 2015). In India lentil is predominantly grown in the North, particularly in Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal. In Uttar Pradesh, it is grown in 620.000 lakh/ha area with 452.000 lakh tones production and 732.0 kg/ha productivity (Ahmad, 2017). It suffers from a number of diseases. Wilt of lentil caused by *Fusarium oxysporum f. sp. lentis* is one of the most wide spread and destructive disease where ever crop is grown. The yield losses due to this disease as much as 50 percent have been reported in India (Anonymous, 1999). The disease manifests as mortality of young seedlings (within 25 to30 days after sowing) to wilting or death of adult plants. Early wilting causes more loss than late

Eur J Plant Pathol
DOI 10.1007/s10658-017-1278-6

Detection and identification of four 16Sr subgroups of phytoplasmas associated with different legume crops in India

G. P. Rao · Madhupriya · Manish Kumar · Sonica Tomar · Bishnu Maya · S. K. Singh · Joy Michal Johnson

Accepted: 19 June 2017
© Koninklijke Nederlandse Plantenziektenkundige Vereniging 2017

Abstract Phytoplasma suspected symptoms of little leaf, flat stem, witches' broom and leaf yellowing were recorded on the four legume species, cowpea (*Vigna unguiculata* (L.) Walp.), pigeon pea (*Cajanus cajan* (L.) Millsp.), lentil (*Lens culinaris* Medikus) and mung bean (*Vigna radiata* (L.) Wilczek) in the states of Delhi, Uttar Pradesh (UP) and Kerala from 2014 to 2016. DNA specific fragments of approximately 1.3 kb were amplified from symptomatic samples of cowpea, pigeon pea, lentil and mung bean in nested PCR assays by using two sets of universal phytoplasma nested specific primers P1/P7 followed by 3Far/3Rev. No DNA amplifications were observed in any of the non-symptomatic legume samples with same primer pairs. Pair wise sequence comparison, phylogeny and virtual RFLP analysis of 16S rDNA sequences of the four legume species confirmed the association of four different groups and subgroups of phytoplasmas in the present study. The mung bean witches' broom at Delhi was identified to be associated with strain related to '*Ca.* P. aurantifolia' (16SrII-D), pigeon pea little leaf at Faizabad, UP with strain related to '*Ca.* P. phoenicium' (16SrIX-C), lentil witches' broom at Faizabad, UP with '*Ca. P. trifolii*' (16SrVI-D) and cow pea flat stem disease at Kerala with '*Ca.* P. cynodontis' (16SrXIV-A). Association of '*Ca.* P. cynodontis' (16SrXIV-A) infecting cowpea, '*Ca. P. trifolii*' (16SrVI-D) in lentil and phytoplasmas strain related to '*Ca.* P. phoenicium' (16SrIX-C) infecting pigeon pea are the new reports to the world.

Keywords Phytoplasma · Identification · Cowpea · Pigeon pea · Lentil · Mung bean

Legumes are a significant source of protein dietary fiber, carbohydrates and dietary mineral, grown agriculturally, primarily for their seed, for livestock and silage, and as soil-enhancing green manure. Cowpea is one of the most important legumes across the semiarid tropics valued for its pods and dried seeds (Kumar et al. 2012). In India, cowpea is grown in an area of 3.9 million hectares with a production of 2.21 million tonnes with the national productivity of 683 kg per ha (Singh et al. 2012). Mung bean is an important edible legume grown in Asia, particularly in the Indian subcontinent, where it is used for human and animal consumption. India is the world's largest producer as well as consumer of green gram (*Vigna radiata*). It produces about 1.5 to 2.0 million tons of mung bean annually from about 3 to 4 million hectares of area, with an average productivity of 500 kg per hectare. Lentil (*Lens culinaris*) is one of the oldest known protein-

G. P. Rao (✉) · Madhupriya · M. Kumar · S. Tomar · B. Maya
Division of Plant Pathology, Indian Agricultural Research Institute, Pusa Campus, New Delhi -110012, India
e-mail: gprao_gor@rediffmail.com

S. K. Singh
Department of Plant Pathology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, UP 224229, India

J. M. Johnson
College of Agriculture, Padannakkad, Kasaragod, Vellayani, Thiruvananthapuram, Kerala -671315, India

Published online: 04 July 2017

Plant Archives Volume 20 No. 2, 2020 pp. 8463-8464 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS AND BENEFIT COST RATIO OF BRINJAL AT DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2], Vinay Kumar Singh[3], Ashok Kumar Singh[4] and Anil Kumar Singh[5]

[1]Department of Farm Management, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, KrishiGyan Kendra, Deoria (U.P.), India.
[3]Department of Horticulture, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main objective of the present study was to analysis the economics and benefit cost ratio of Brinjal in two villages of Ghazipur district of Uttar Pradesh, India. It was found that the farmers of all selected randomly groups has been taken the crop on their field through a good advance package of practices, therefore their yield and net return in all size groups increased respectively in time. The study concludes yield and net return should be increased in future if they go through a good farm plans along with better crop management systems.

Key Words: Village, Farmers, Yield, Income, Farm plans.

Introduction

Brinjal (*Solanum melongena* L.) is warm season crop its plant not with stand frost the main sowing season being during July-August for a good yield 20-25 tons of FYM per hectare incorporated into the soil at the time of field preparation. It is necessary to maintain an even moisture supply in the soil; over watering is as harmful as insufficient irrigation. In this crop, phomopsis wilt is the most important fungal disease and is seed borne. Hot water treatment of the Seed helps to reduce the incidence of the disease. Little leaf is caused by mycoplasma and can be partially controlled with antibiotics. Brinjal is prone to attack by many damages caused by insects, pests, fungus, bacteria and viruses Purohit ML and Khatri AK (1973). Brinjal productions area consistently and extensively damaged by brinjal fruit and shoot borer and other fruit borer insects reported by Kuppu Swamy and Balasubramanian (1980). To reduce pest linked damage in brinjal as well as to protect the environment from adverse effect of pesticides, as an insect resistance management strategy Ghosh *et al.,* (2003). In India brinjal is the major source of profitable income for farmers because of local demand and it is a perennial crop so that fruit can be harvested throughout the year. A large number of brinjal varieties and hybrids are grown by small medium, large size of farmers throughout the year.

Materials and Methods

The present study was conducted in two randoml selected villages namely Jaitpur (Block-Sador) an secondly Gaura (Block-Sadat) in Ghazipur district of Utta Pradesh, India with farmers Scientist Collaborations i demonstrated groups small, medium and large size whil selected randomly seven farmers from each group Narendra hybrid Baigan-1 has been suggested seed rat 500-600 gram per hectare during field preparations 2 tons of FYM allowed to the soil planting distance line t line 60-75 cm and plant to plant are 45-60 cm. wa proposed. Crop was taken on the field during July-Augus Season N:P:K:@ 100:50:25 Kg/hectare for better qualit and better yield advised. All the advance package c practices has been specify for timely whenever neede Survey method has been used to collect the data an tabular analysis was being used. Family schedule ha been used to collect the data from the selected farme according to their size of holdings, family size, area the productionand income of the crop etc.The economi has been calculated at their current price rates.

Plant Archives Volume 20 No. 2, 2020 pp. 9368-9369 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY THE PRODUCTIVITY AND INCOME LEVEL OF POTATO UNDER VARIES FARM SIZE GROUPS

Ajit Verma[1], Anil Kumar Singh[2], Ashok Kumar Singh[3], Sarita Srivastava[4] and Vinay Kumar singh[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[5]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.

Abstract

The main aim of present study was to find out the productivity and income levels of Potato (Kufri Sinduri) on randomly selected in different farm size groups in randomly selected village Govindpur and Kusmahi Khurd of Ghazipur district of U.P., India. It was found that yield and net income was increased in all size groups in both villages, but village Kusmahi Khurd farmers perform well. The result shows that all the package of practices was properly used. For the better yield and good quality of crop in future farmers of the both villages have aware about their application of all the Agro-Economical package of practices and crop management.

Key words: Yield, Income, Package of practices, Specific trends.

Introduction

Potato is one of the most valuable and cash crop in the world as well as in our country Indian. It is capable of producing more weight and calories for human beings in comparison to other crops. For this crop some time manual weeding is tedious which causes root injury resulting yield and qualities are affected under such circumstances chemical weeding is economical and preferable. Gran manuring, recycling crop residues and animal manures, and the inclusion of legumes in rotation, is important. Integrated nutrient supply is essential for production and qualities. Nitrogen plays an important role in improving the growth and its yield. Evidence is growing of favorable effect of phosphate solubilizing bacteria in providing plant nutrients to several crops and in supplements the expensive inorganic fertilizers. Sing and Sharma (1994) and Daka and Dutta (1997) reported significant response of potato to Nitrogen level in acidic soils. Combine inoculation of Azotobacter and Phospho-inoculant culture is good for tuber yield and qualities. Use of Azotobactor and phospho-inoculant indicates that the bio-fertilizer increased the efficiency of applied nitrogen. Use of organic sources of nutrients, good quality of compost is better for tuber yield with better qualities Potato tubers are planted either whole or cut into pieces. This crop needs irrigation of frequent intervals depend upon the soil and climatic conditions. Usually, six irrigation are sufficient.

Materials and Methods

The present study was conducted in the selected randomly Village Govindpur of (Block-Mardah) and Kusmahi Khurd (Block-Devakali) in Ghazipur district of Uttar Pradesh, India through collaborations of farmers-scientist on the basis of small, medium and large size of farms. Randomly selected seven farmers from each groups Kufri-Sinduri Variety of potato suggested for the above demonstrated groups. For better yield suggested 25 tons of FYM along with 120:80:100 Kg/heet of NPK. The crop has been taken on the field during second fort night of November on ridges. All advance packages of practices has been specify for timed application or whenever it needed. Survey method has been used to collect the data and tabular analysis was being made. family schedule has been used to collect the data from the selected farmers according to their size of holdings family size, area of the production and income of the

Plant Archives Volume 20 No. 2, 2020 pp. 8995-8996 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS OF CHILLI *(CAPSICUM ANNUUM)* ON DIFFERENT FARM CONDITIONS

Ajit Verma[1], Vinay Kumar Singh[2], Anil Kumar Singh[3], Ashok Kumar Singh[4] and Sarita Srivastava[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.

Abstract

The main objective of the present study was to study the Economics of Chilli in the randomly selected farmers of villages in Ghazipur district of Uttar Pradesh, India. It was found that farmers has adopted all the advance package of practices and applied time to time during the cropping time resulted good yield and high net incomes. In future it will also be improved whenever they use better crop management practices with high profile business thinking.

Key Words: Village, Yield, Farmers, Specific, Trends, Exhibits.

Introduction

Chilli also called 'red paper' is an important cash crop in India and is grown for its pungent fruits, which are used both green and ripe (the letter in the dried form) to import pungency to the food. As a condiment, it has becomes indispensable in every Indian home. It is also used medicinally, and in chantries and pickles. Capsicum plants are herbaceous or semi woody annuals or perennials very high rainfall during its growth is harmful. Under irrigation and good manuring, excellent crops can be raised in sandy and light alluvial loans as well as in red loamy soils. As a garden crop, it is sometimes allowed to grow as a stand-over crop for one or two seasons. The land is ploughed and harrowed 3 or 4 times to obtain a fine fifth. Recommended dose of FYM is better for good yield and better qualities. The Chilli is generally transplanted, through direct sowing. Foliar spray of Zinc and Iron not increase the yield and quality of the crop Pillai and Vadivelu (1967). The combined spray of Zinc, boron and iron through soil or its foliar Spray is better for good yielding. Saryandrayra and Hariprasad (1985) reported that these micronutrients increased the green yield of Chillies. Hosmani and Hosmani (1993) give details about Chillies inthier second edition. Seeds taken from healthy, well matured fruits selected for the purpose are mixed with ashes and shown evenly in well-manured nursery beads. The nursery treatment and other recommended practices had been taken at the time of their requirements.

Materials and Methods

The present study was conducted on the field in Ghazipur district of Uttar Pradesh, India in randomly selected two villages namely Bishunpura (Block-Karanda) and Secondly Gajpatpur (Block-Berno) through farmers-scientist collaborations ranging small, medium and large size farmers groups. Seven farmers from each groups has been selected randomly. Pusa Sadabahar Chilli Variety has been offered for the demonstrations. Allowed 1 Kg. seed for a hectare to maintain line to line distance about 50 Cm and plant to plant distance 45 Cm. The crop has been taken on the field on the field during August-September. All the package of practices has been introduced to the farmers for their better yield and qualities regarding time to time applications. All the information has been collected through survey method and tabular analysis was being used. Family schedule has been used to collect the data regarding family size, area of the crop, expenditure and net income. Emphasis has been given on cultural operation irrigation and other recommended practices for the upliftment of the crop.

Plant Archives Volume 20 No. 2, 2020 pp. 8463-8464 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS AND BENEFIT COST RATIO OF BRINJAL AT DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2], Vinay Kumar Singh[3], Ashok Kumar Singh[4] and Anil Kumar Singh[5]

[1]Department of Farm Management, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, KrishiGyan Kendra, Deoria (U.P.), India.
[3]Department of Horticulture, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main objective of the present study was to analysis the economics and benefit cost ratio of Brinjal in two villages of Ghazipur district of Uttar Pradesh, India. It was found that the farmers of all selected randomly groups has been taken the crop on their field through a good advance package of practices, therefore their yield and net return in all size groups increased respectively in time. The study concludes yield and net return should be increased in future if they go through a good farm plans along with better crop management systems.

Key Words: Village, Farmers, Yield, Income, Farm plans.

Introduction

Brinjal (*Solanum melongena* L.) is warm season crop its plant not with stand frost the main sowing season being during July-August for a good yield 20-25 tons of FYM per hectare incorporated into the soil at the time of field preparation. It is necessary to maintain an even moisture supply in the soil; over watering is as harmful as insufficient irrigation. In this crop, phomopsis wilt is the most important fungal disease and is seed borne. Hot water treatment of the Seed helps to reduce the incidence of the disease. Little leaf is caused by mycoplasma and can be partially controlled with antibiotics. Brinjal is prone to attack by many damages caused by insects, pests, fungus, bacteria and viruses Purohit ML and Khatri AK (1973). Brinjal productions area consistently and extensively damaged by brinjal fruit and shoot borer and other fruit borer insects reported by Kuppu Swamy and Balasubramanian (1980). To reduce pest linked damage in brinjal as well as to protect the environment from adverse effect of pesticides, as an insect resistance management strategy Ghosh *et al.*, (2003). In India brinjal is the major source of profitable income for farmers because of local demand and it is a perennial crop so that fruit can be harvested throughout the year. A large number of brinjal varieties and hybrids are grown by small, medium, large size of farmers throughout the year.

Materials and Methods

The present study was conducted in two randomly selected villages namely Jaitpur (Block-Sador) and secondly Gaura (Block-Sadat) in Ghazipur district of Uttar Pradesh, India with farmers Scientist Collaborations in demonstrated groups small, medium and large size while selected randomly seven farmers from each groups Narendra hybrid Baigan-1 has been suggested seed rate 500-600 gram per hectare during field preparations 25 tons of FYM allowed to the soil planting distance line to line 60-75 cm and plant to plant are 45-60 cm. was proposed. Crop was taken on the field during July-August Season N:P:K:@ 100:50:25 Kg/hectare for better quality and better yield advised. All the advance package of practices has been specify for timely whenever needed. Survey method has been used to collect the data and tabular analysis was being used. Family schedule has been used to collect the data from the selected farmers according to their size of holdings, family size, area of the productionand income of the crop etc.The economics has been calculated at their current price rates.

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 03 Issue: 02 | Feb 2022 ISSN: 2660-5317

Integrated Weed Management in Rice Wheat Cropping System

Dr. Ashok Kumar Singh
Assistant Professor, Dept. of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh, Uttar Pradesh, India

Dr. Vinod Bahadur Singh
Subject Matter Specialist, (Genetics and Plant Breeding), Krishi Vigyan Kendra, Basti, Uttar Pradesh, India

Acharya Narendra Dev
University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Received 24th Jan 2022, Accepted 15th Feb 2022, Online 27th Feb 2022

Abstract: Integrated Weed Management (IWM) means integrating multiple weed control tactics into a single weed management program, optimizing control of a particular weed problem. The past several decades have seen simplified weed control practices that rely heavily on a few popular herbicides. However, the rapid spread of herbicide-resistant weeds has required farmers to incorporate alternative weed management approaches. While many farmers are incorporating different herbicides, this is likely to have only short-term success. Using non-herbicide approaches in combination with multiple, effective sites of action is needed for long-term success. It might be better to first discuss why weed control is necessary. Weeds negatively impact crop yields, interfere with many crop production practices, and weed seeds can contaminate grain. Based on national research, corn and soybean yield can be reduced by approximately 50% without effective weed control.

Herbicide application is the main weed control strategy used. Reliance on this one method has led to the development of herbicide-resistant weeds. There are a limited number of herbicides available to use and cases of herbicide resistance are rapidly increasing in the US. As a result, herbicides are in need of extra help to continue to ensure adequate weed control.

IWM tactics span a wide range of options and complexity. Many IWM tactics can be integrated without substantial change to current management programs, while others require more extensive planning and implementation. Some options that are easier to implement include: equipment cleaning, timely scouting, altering herbicide tank mixes; while more extensive options include: changing crop rotation, cover cropping, changing tillage practices, and harvest time weed seed control.

The goal of IWM is to incorporate different methods of weed management into a combined effort to control weeds. Just as using the same herbicide again and again can lead to resistance, reliance on any one of the methods below over time can reduce its efficacy against weeds. Two major factors to consider when developing an IWM plan are (1) target weed species and (2) time, resources, and capabilities necessary to implement these tactics.

© 2022, CAJOTAS, Central Asian Studies, All Rights Reserved

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of Creative Commons

 ISSN 2694-9970

Effect of Nutrient Management Practices on Growth Yield and Nutrient Uptake in Basmati Rice

Dr. Ashok Kumar Singh
Assistant Professor, Dept. of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh, Uttar Pradesh, India

Dr. Vinod Bahadur Singh
Subject Matter Specialist, (Genetics and Plant Breeding), Krishi Vigyan Kendra, Basti, Uttar Pradesh, India

Acharya Narendra Dev
University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

ABSTRACT

Basmati, pronounced is a variety of long, slender-grained aromatic rice which is traditionally grown in India, Pakistan, Bangladesh and Nepal. As of 2019, India accounted for 65% of the international trade in basmati rice, while Pakistan accounted for the remaining 35%.Many countries use domestically grown basmati rice crops; however, basmati is geographically exclusive to certain districts of India and Pakistan.According to the Indian Government agency APEDA, a rice variety is eligible to be called basmati if it has a minimum average precooked milled rice length of 6.61 mm (0.260 in) and average precooked milled rice breadth of up to 2 mm (0.079 in), among other parameters. The areas which have GI tag for basmati rice production in India are in the states of Punjab, Haryana, Himachal Pradesh, Delhi, Uttarakhand, Western Uttar Pradesh and Jammu and Kashmir. India's total basmati production for the July 2011–June 2012 crop year was five million tonnes.From April 2018 to March 2019, India exported 4.4 million metric tons of basmati rice.In 2015–16, Saudi Arabia, Iran and UAE were the three biggest destinations for India's basmati rice exports and exports to these three countries accounted for more than half of India's total basmati exports.In 2015–16, basmati rice worth US$3.4 billion was exported from India.

There are several varieties of basmati rice. Traditional Indian types include basmati 370, basmati 385, and basmati Ranbirsinghpura (R.S.Pura) and Gujjar Chack area in Jammu province situated at the India-Pakistani border in Jammu and Kashmir state of India. 1121 and Muradabadi 6465 Extra Long Grain Rice. Pakistani varieties of basmati rice are PK 385, Super Kernel Basmati Rice and D-98.Scientists at Indian Agricultural Research Institute, Delhi, used conventional plant breeding to produce a hybrid semi-dwarf plant which had most of the good features of traditional basmati (grain elongation, fragrance, alkali content). This hybrid was called Pusa Basmati-1 (PB1; also called "Todal", because the flower has awns); crop yield is up to twice as high as traditional varieties. Fragrant rices that are derived from basmati stock but are not true basmati varieties include PB (also called sugandh-2), PB3, and RS-10.

KEYWORDS: *basmati rice, growth, yield, nutrient uptake, aromatic, varieties, fragrant, hybrid.*

Plant Archives Volume 20 No. 2, 2020 pp. 8463-8464 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS AND BENEFIT COST RATIO OF BRINJAL AT DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2], Vinay Kumar Singh[3], Ashok Kumar Singh[4] and Anil Kumar Singh[5]

[1]Department of Farm Management, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, KrishiGyan Kendra, Deoria (U.P.), India.
[3]Department of Horticulture, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main objective of the present study was to analysis the economics and benefit cost ratio of Brinjal in two villages of Ghazipur district of Uttar Pradesh, India. It was found that the farmers of all selected randomly groups has been taken the crop on their field through a good advance package of practices, therefore their yield and net return in all size groups increased respectively in time. The study concludes yield and net return should be increased in future if they go through a good farm plans along with better crop management systems.

Key Words: Village, Farmers, Yield, Income, Farm plans.

Introduction

Brinjal (*Solanum melongena* L.) is warm season crop its plant not with stand frost the main sowing season being during July-August for a good yield 20-25 tons of FYM per hectare incorporated into the soil at the time of field preparation. It is necessary to maintain an even moisture supply in the soil; over watering is as harmful as insufficient irrigation. In this crop, phomopsis wilt is the most important fungal disease and is seed borne. Hot water treatment of the Seed helps to reduce the incidence of the disease. Little leaf is caused by mycoplasma and can be partially controlled with antibiotics. Brinjal is prone to attack by many damages caused by insects, pests, fungus, bacteria and viruses Purohit ML and Khatri AK (1973). Brinjal productions area consistently and extensively damaged by brinjal fruit and shoot borer and other fruit borer insects reported by Kuppu Swamy and Balasubramanian (1980). To reduce pest linked damage in brinjal as well as to protect the environment from adverse effect of pesticides, as an insect resistance management strategy Ghosh *et al.,* (2003). In India brinjal is the major source of profitable income for farmers because of local demand and it is a perennial crop so that fruit can be harvested throughout the year. A large number of brinjal varieties and hybrids are grown by small medium, large size of farmers throughout the year.

Materials and Methods

The present study was conducted in two randoml selected villages namely Jaitpur (Block-Sador) an secondly Gaura (Block-Sadat) in Ghazipur district of Utta Pradesh, India with farmers Scientist Collaborations i demonstrated groups small, medium and large size whil selected randomly seven farmers from each group Narendra hybrid Baigan-1 has been suggested seed rat 500-600 gram per hectare during field preparations 2 tons of FYM allowed to the soil planting distance line t line 60-75 cm and plant to plant are 45-60 cm. wa proposed. Crop was taken on the field during July-Augus Season N:P:K:@ 100:50:25 Kg/hectare for better qualit and better yield advised. All the advance package c practices has been specify for timely whenever neede Survey method has been used to collect the data an tabular analysis was being used. Family schedule ha been used to collect the data from the selected farmer according to their size of holdings, family size, area c the productionand income of the crop etc.The economi has been calculated at their current price rates.

Plant Archives Volume 20 No. 2, 2020 pp. 9368-9369 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY THE PRODUCTIVITY AND INCOME LEVEL OF POTATO UNDER VARIES FARM SIZE GROUPS

Ajit Verma[1], Anil Kumar Singh[2], Ashok Kumar Singh[3], Sarita Srivastava[4] and Vinay Kumar singh[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[5]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.

Abstract

The main aim of present study was to find out the productivity and income levels of Potato (Kufsi Sinduri) on randomly selected in different farm size groups in randomly selected village Govindpur and Kusmahi Khurd of Ghazipur district of U.P., India. It was found that yield and net income was increased in all size groups in both villages, but village Kusmahi Khurd farmers perform well. The result shows that all the package of practices was properly used. For the better yield and good quality of crop in future farmers of the both villages have aware about their application of all the Agro-Economical package of practices and crop management.

Key words: Yield, Income, Package of practices, Specific trends.

Introduction

Potato is one of the most valuable and cash crop in the world as well as in our country Indian. It is capable of producing more weight and calories for human beings in comparison to other crops. For this crop some time manual weeding is tedious which causes root injury resulting yield and qualities are affected under such circumstances chemical weeding is economical and preferable. Gran manuring, recycling crop residues and animal manures, and the inclusion of legumes in rotation, is important. Integrated nutrient supply is essential for production and qualities. Nitrogen plays an important role in improving the growth and its yield. Evidence is growing of favorable effect of phosphate solubilizing bacteria in providing plant nutrients to several crops and in supplements the expensive inorganic fertilizers. Sing and Sharma (1994) and Daka and Dutta (1997) reported significant response of potato to Nitrogen level in acidic soils. Combine inoculation of Azotobacter and Phospho-inoculant culture is good for tuber yield and qualities. Use of Azotobactor and phospho-inoculant indicates that the bio-fertilizer increased the efficiency of applied nitrogen. Use of organic sources of nutrients, good quality of compost is better for tuber yield with better qualities Potato tubers are planted either whole or cut into pieces. This crop needs irrigation of frequent intervals depend upon the soil and climatic conditions. Usually, six irrigation are sufficient.

Materials and Methods

The present study was conducted in the selected randomly Village Govindpur of (Block-Mardah) and Kusmahi Khurd (Block-Devakali) in Ghazipur district of Uttar Pradesh, India through collaborations of farmers-scientist on the basis of small, medium and large size of farms. Randomly selected seven farmers from each groups Kufri-Sinduri Variety of potato suggested for the above demonstrated groups. For better yield suggested 25 tons of FYM along with 120:80:100 Kg/heet of NPK. The crop has been taken on the field during second fort night of November on ridges. All advance packages of practices has been specify for timed application or whenever it needed. Survey method has been used to collect the data and tabular analysis was being made, family schedule has been used to collect the data from the selected farmers according to their size of holdings family size, area of the production and income of the

Plant Archives Volume 20 No. 2, 2020 pp. 9368-9369 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY THE PRODUCTIVITY AND INCOME LEVEL OF POTATO UNDER VARIES FARM SIZE GROUPS

Ajit Verma[1], Anil Kumar Singh[2], Ashok Kumar Singh[3], Sarita Srivastava[4] and Vinay Kumar singh[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[5]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.

Abstract

The main aim of present study was to find out the productivity and income levels of Potato (Kufri Sinduri) on randomly selected in different farm size groups in randomly selected village Govindpur and Kusmahi Khurd of Ghazipur district of U.P., India. It was found that yield and net income was increased in all size groups in both villages, but village Kusmahi Khurd farmers perform well. The result shows that all the package of practices was properly used. For the better yield and good quality of crop in future farmers of the both villages have aware about their application of all the Agro-Economical package of practices and crop management.

Key words: Yield, Income, Package of practices, Specific trends.

Introduction

Potato is one of the most valuable and cash crop in the world as well as in our country Indian. It is capable of producing more weight and calories for human beings in comparison to other crops. For this crop some time manual weeding is tedious which causes root injury resulting yield and qualities are affected under such circumstances chemical weeding is economical and preferable. Gran manuring, recycling crop residues and animal manures, and the inclusion of legumes in rotation, is important. Integrated nutrient supply is essential for production and qualities. Nitrogen plays an important role in improving the growth and its yield. Evidence is growing of favorable effect of phosphate solubilizing bacteria in providing plant nutrients to several crops and in supplements the expensive inorganic fertilizers. Sing and Sharma (1994) and Daka and Dutta (1997) reported significant response of potato to Nitrogen level in acidic soils. Combine inoculation of Azotobacter and Phospho-inoculant culture is good for tuber yield and qualities. Use of Azotobactor and phospho-inoculant indicates that the bio-fertilizer increased the efficiency of applied nitrogen. Use of organic sources of nutrients, good quality of compost is better for tuber yield with better qualities Potato tubers are planted either whole or cut into pieces. This crop needs irrigation of frequent intervals depend upon the soil and climatic conditions. Usually, six irrigation are sufficient.

Materials and Methods

The present study was conducted in the selected randomly Village Govindpur of (Block-Mardah) and Kusmahi Khurd (Block-Devakali) in Ghazipur district of Uttar Pradesh, India through collaborations of farmers-scientist on the basis of small, medium and large size of farms. Randomly selected seven farmers from each groups Kufri-Sinduri Variety of potato suggested for the above demonstrated groups. For better yield suggested 25 tons of FYM along with 120:80:100 Kg/hect of NPK. The crop has been taken on the field during second fort night of November on ridges. All advance packages of practices has been specify for timed application or whenever it needed. Survey method has been used to collect the data and tabular analysis was being made. family schedule has been used to collect the data from the selected farmers according to their size of holdings family size, area of the production and income of the

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 03 Issue: 02 | Feb 2022 ISSN: 2660-5317

Integrated Weed Management in Rice Wheat Cropping System

Dr. Ashok Kumar Singh
Assistant Professor, Dept. of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh, Uttar Pradesh, India

Dr. Vinod Bahadur Singh
Subject Matter Specialist, (Genetics and Plant Breeding), Krishi Vigyan Kendra, Basti, Uttar Pradesh, India

Acharya Narendra Dev
University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Received 24th Jan 2022, Accepted 15th Feb 2022, Online 27th Feb 2022

Abstract: Integrated Weed Management (IWM) means integrating multiple weed control tactics into a single weed management program, optimizing control of a particular weed problem. The past several decades have seen simplified weed control practices that rely heavily on a few popular herbicides. However, the rapid spread of herbicide-resistant weeds has required farmers to incorporate alternative weed management approaches. While many farmers are incorporating different herbicides, this is likely to have only short-term success. Using non-herbicide approaches in combination with multiple, effective sites of action is needed for long-term success. It might be better to first discuss why weed control is necessary. Weeds negatively impact crop yields, interfere with many crop production practices, and weed seeds can contaminate grain. Based on national research, corn and soybean yield can be reduced by approximately 50% without effective weed control.

Herbicide application is the main weed control strategy used. Reliance on this one method has led to the development of herbicide-resistant weeds. There are a limited number of herbicides available to use and cases of herbicide resistance are rapidly increasing in the US. As a result, herbicides are in need of extra help to continue to ensure adequate weed control.

IWM tactics span a wide range of options and complexity. Many IWM tactics can be integrated without substantial change to current management programs, while others require more extensive planning and implementation. Some options that are easier to implement include: equipment cleaning, timely scouting, altering herbicide tank mixes; while more extensive options include: changing crop rotation, cover cropping, changing tillage practices, and harvest time weed seed control.

The goal of IWM is to incorporate different methods of weed management into a combined effort to control weeds. Just as using the same herbicide again and again can lead to resistance, reliance on any one of the methods below over time can reduce its efficacy against weeds. Two major factors to consider when developing an IWM plan are (1) target weed species and (2) time, resources, and capabilities necessary to implement these tactics.

© 2022, CAJOTAS, Central Asian Studies, All Rights Reserved

Copyright (c) 2021 Author (s). This is an open-access article distributed under the terms of Creative Commons

The Pharma Innovation Journal 2021; 10(10): 897-902
www.ThePharmaJournal.com
The Pharma Innovation
ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 897-902
© 2021 TPI
www.thepharmajournal.com
Received: 10-08-2021
Accepted: 12-09-2021

SP Giri
Crop Research Station, (ANDUAT), Masodha, Ayodhya, Uttar Pradesh, India

DK Diwedi
Crop Research Station, (ANDUAT), Masodha, Ayodhya, Uttar Pradesh, India

Saurabh Dixit
Crop Research Station, (ANDUAT), Masodha, Ayodhya, Uttar Pradesh, India

Aman Singh
Department of G.P.B. A.N.D.U.A.T. Kumarganj, Ayodhya, Uttar Pradesh, India

V Prasad
Crop Research Station, (ANDUAT), Masodha, Ayodhya, Uttar Pradesh, India

N Prakash
Crop Research Station (ANDUAT), Ghaghraghat, Bahraich, Uttar Pradesh, India

SKS Rajpoot
Crop Research Station (ANDUAT), Ghaghraghat, Bahraich, Uttar Pradesh, India

RA Singh
Crop Research Station (ANDUAT), Ghaghraghat, Bahraich, Uttar Pradesh, India

Corresponding Author:
SP Giri
Crop Research Station, (ANDUAT), Masodha, Ayodhya, Uttar Pradesh, India

Assessment of variability of rice (*Oryza sativa* L.) germplasm using agro-morphological characterization

SP Giri, DK Diwedi, Saurabh Dixit, Aman Singh, V Prasad, N Prakash, SKS Rajpoot and RA Singh

Abstract
Investigation was undertaken at Crop Research Station, (ANDUAT) Masodha during 2019 to study the performance of various rice genotypes. The present study was carried out to characterize nine hundred seventy five rice germplasm accessions on the basis of twenty-nine morphological and eight agronomical traits. Most of the morphological characters showed variation in different accessions except leaf collar leaf ligule and leaf shape of ligule. A significant amount of variation was displayed for most of the agronomical traits examined. After evaluation of 975 accessions for eight quantitative characters, on the basis of mean values, top ten accessions were identified for the yield and ancillary traits. These can be used to identify phenotypically divergent sources for traits of interest in breeding programmes.

Keywords: agro-morphological characters, germplasm, variability, rice, phenotypically

Introduction
Rice (*Oryza sativa* L.) is the world's most important food crop belongs to Poaceae. It serves as the staple food for more than half of the globe's population (khan *et al*., 2013). Rice is the second most important crop which brings economic prosperity of the growers as well as earns billions of rupees through its export for country. Rice is the third highest produced cereal after wheat and maize (FAOSTAT, 2012) [9]. It is the main staple food for about 50% of the world's population, especially in developing countries (FAO, 2017) [9]. By the year 2025, global demand for rice will be 880 million tonnes compared to the current world production of 470 million tonnes of milled rice (IRRI, 2010). The average growth rate of rice yield was 3.68% annually in the 1980s, but it decreased to 0.75% per year in the late1990s and rice productions are still low in the world (FAO, 2017) [9]. In years to come, expanding the areas of rice cultivation will be limited because of land and water resource scarcity due to climate changes, urbanization and population growth. Pressure from biotic and abiotic factors, declining productivity in intensive rice production systems, increasing the cost of production and low yielding varieties are some of the factors responsible for the low yield of rice obtained by farmers. The large scale spread of modern, high yielding varieties has replaced the traditional varieties especially in the irrigated rice ecosystem leading to reduced genetic base and thus increased genetic variability. In past few decades, increase in share of high yielding varieties and shrinkage in the area of local varieties have been reported in India (Hore 2005; Rana *et al*., 2009) [17] as well as in several other countries (Chaudhary *et al*., 2006; Itani 1993) [5, 12]. There is an urgent need to broaden the genetic base of the important crop by introgressing genes from diverse sources. Breeding for rice varieties that produces higher yields of grain per unit land area is crucial to achieving increased rice production especially because of reduction in the land available for rice cultivation (Paterson *et al*., 2005) [6]. The effectiveness of any rice improvement programme depends on the utilization of different germplasm around the world (Susan *et al*., 2012) [18]. These germplasm can only be utilized optimally by breeders if it is well characterized. Therefore, the objective of this study was to characterize a set of rice germplasm collected from eastern Uttar Pradesh analyzed the agro-morphological traits.

Material and Methods
The experiment was conducted during WS 2017, 2018 and 2019 at Crop Research Station, Masodha, which is situated at 26.47°N (latitude), 82.12 °E (longitude) and at 113 m (altitude). Soil of the experimental field is sandy loam with pH 7.2, organic carbon 0.40%. Crop nursery was grown in raised beds and twenty three days old seedlings were transplanted in the first

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(5): 1140-1143
© 2022 TPI
www.thepharmajournal.com
Received: 27-03-2022
Accepted: 30-04-2022

Rahul Kumar Maurya
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

DK Dwivedi
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

NA Khan
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

SP Giri
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Saurabh Dixit
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rahul Kumar Maurya
Department of Plant Molecular Biology and Genetic Engineering, Achraya Narandra Deva University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Genetic variability studies for qualitative and quantitative traits in rice (*Oryza sativa* L.)

Rahul Kumar Maurya, DK Dwivedi, NA Khan, SP Giri and Saurabh Dixit

Abstract
The experiment was consisted of nineteen rice germplasm *viz*; IET26383, DRR Dhan-49, R-RHZ-1B-80, R-RH-2-M1-93, CGZR-1/IET 23824, Samba mahsuri, DRR Dhan 48, CR Dhan 311, R-RHZ-SM-14, MI 127, R-RHZ-111-82, IR 64, CGZR-2(IET23824), Zinco rice(IET25477), CR Dhan-310(IET 24780), R-RHP-MI-30(IET 25461), MI156, CR2818-1-11-1-B-1-1-2-B-1 and DRR Dhan 45. The analyses of variance revealed that mean sum of squares were highly significant for all the traits for rice genotypes. Genetic variability, phenotypic coefficient of variability (PCV), genotypic coefficient of variability (GCV), heritability in broad sense and genetic advance in percent of mean were analyzed. High variability was observed in case of plant height cm, grain width and total spikelets. High estimates of heritability were observed for biological yield/plant. The magnitude of phenotypic correlation was higher than the genotypic correlation. Grain yield/plant showed highly significant and positive correlation with panicle length and grain width.

Keywords: Genetic advance, Genetic variability, Heritability and Rice

Introduction
Rice is an ancient staple food cereal crop of the world's and feeding the variety of dishes and dietary needs of people living in the tropics and subtropics. The introduction of high yielding heterotic hybrids under commercial agriculture has resulted in a quantum leap in rice yield enhancement. However, because rice is the country's basic food, increasing its productivity has become critical (Subbaiah *et al*., 2011) [17]. For genetic inhencement, understanding the nature and extent of genetic variation influencing the inheritance of quantitative traits like yield and its components is critical. A thorough examination of genetic diversity is required before beginning any crop improvement effort or using appropriate selection procedures. India is not self-sufficient in food grain production, but also the world's second largest producer and exporter of high-quality rice (Sreedhar *et al*., 2005) [16]. Rice is a vital crop that feeds nearly half of the world's population, accounting for more than half of their daily calorie intake (Maclean *et al*., 2002) [9]. Magnesium, thiamin, niacin, phosphorus, vitamin B6, zinc, and copper are all found in it. Iron, potassium, and folic acid are all present in some kinds. White rice is one of the least protein-dense grains; yet, some enhanced types may deliver 14 gm of protein per 100 gm. Rice contains a variety of energy-dense substances such as carbohydrates, lipids, protein, and a moderate quantity of calcium and riboflavin (Juliano *et al*., 1993) [7]. Humans consume the majority of rice. *Oryza sativa* is a cattle feed with a variety of industrial and non-industrial uses, in addition to providing a major share of the daily calorie and protein intake for half of the world's population. Correlation is a great tool for studying character associations, and it was thus highly beneficial in determining a selection strategy for improving a character without compromising gains in other qualities. Correlation and route analysis reveal the magnitude of the relationship between grain yield and its components, as well as the relative importance of their direct and indirect impacts, providing a clear picture of their relationship with grain yield (Babu *et al*. 2012) [3]. Rice possesses the world's biggest collection of genetic diversity, and India is home to a wide range of rice cultivars, landraces, and many lesser-known types that have been cultivated by farmers for centuries. The evaluation of genetic diversity is a fundamental principle in crop improvement breeding, which involves the transfer of beneficial features to other genotypes Sasaki (2005) [12] and Varshney *et al*. (2008) [19]. Evaluation of locally adapted germplasm is the first stage in breeding for a specific characteristic, and land races are an excellent starting point for breeders looking to develop crop varieties with desirable traits (Shimelis and Laing 2012).

Oryza Vol. 57 Issue No. 4, 2020 (271-276)
DOI https://doi.org/10.35709/ory.2020.57.4.2

Combining ability analysis for yield and contributing traits in short duration rice (*Oryza sativa* L.)

Vineeta Singh*[1], DK Dwivedi[1], NA Khan[1], RL Verma[2], Manish Kumar[3], Debarchana Jena[2], Diptibala Rout[2], Pandurang Arsode[3] and Sanghamitra Samantaray[2]

[1]Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

[2]ICAR-National Rice Research Institute, Cuttack, Odisha, India

[3]Institute of Agricultural Science, Banaras Hindu University, Varanasi, Uttar Pradesh, India

*Corresponding Author e-mail: vineetasingh.vin@gmail.com

Received: 7 September 2020 Accepted: 26 December 2020 Published: 30 December 2020

ABSTRACT

The breeding value is an important genetic parameter determines utility of lines genotypes to be used as parent in breeding program. This study was aimed at dissecting the breeding values (combining abilities) in 8 short duration rice lines for yield and 15 attributing traits. Altogether, 28 F1s developed under half-diallel fashion along with eight parents were evaluated. The study revealed importance of both additive and non-additive gene effects in governing yield and yield components with preponderance of non-additive gene action for most of the yield components. Additive gene action was found important for 1000-grain weight. The parental genotype (NUD3) and (NDR 359) were found to be good general combiners. The hybrids namely NDR359 Sarjoo-52, NDR359 NUD2, NDR359 NDRK5088, NDR359 NDR1, NDR359 Nagina22, NDR359 NUD3, NDR359 CSR10, Sarjoo52 NDRK5088, Sarjoo52 X NDR 1, NUD 2 NDR1, NUD 2 NUD3, NDRK5088 Nagina22, NDRK5088 NUD3, NDRK5088 CSR10, NUD 3 Nagina 22, Nagina 22 NUD3, NUD3 CSR 10 have shown significant favourable sca effect for yield and different yield components.

Key words: *Diallel analysis, breeding value, combining ability, gca effect, sca effect, additive gene action*

INTRODUCTION

Rice, a staple food crop which nourish over half of the global population is seems to be threatened adversely under shattering climatic scenario (Khus et al., 2005; Kumar et al., 2018; Rout et al. 2020). Rice researchers are increasingly challenged in the new century to meet the rapidly growing food demands of an ever-growing population. Its production is affected by many biotic and abiotic stresses across the ecologies throughout the world. Poor water management, increased competition for limited water resources, and the uncertain threats associated with global warming all highlight the looming water crisis that threatens agricultural productivity worldwide. The cultivation of short duration rice is very economical for farmers, but owing to very poor in yield potential and sustainability under extreme condition needs further research attention. In order to formulate efficient breeding strategies for improvement of yield, it is essential to characterise the nature and mode of gene action that determines the yield and its components. A sound breeding methodology rests on a proper understanding of the gene effects involved (Kumar et al., 2012).

The breeding value and combining ability studies of the parents and their crosses provide insights for the selection of compatible parents which prerequisite for any breeding program. Assessment of breeding values/ combining ability of the parents helps in its judicious utilization with precision and accuracy.

International Journal of Chemical Studies 2020, SP-9(1): 85-90

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902

IJCS 2021; SP-9(1): 85-90
© 2021 IJCS
Received: 17-11-2020
Accepted: 21-12-2020

SP Giri
Crop Research Station,
ANDUAT, Masodha, Ayodhya,
Uttar Pradesh, India

Saurabh Dixit
Crop Research Station,
ANDUAT, Masodha, Ayodhya,
Uttar Pradesh, India

V Prasad
Crop Research Station,
ANDUAT, Masodha, Ayodhya,
Uttar Pradesh, India

DK Diwedi
Crop Research Station,
ANDUAT, Masodha, Ayodhya,
Uttar Pradesh, India

N Prakash
Crop Research Station,
ANDUAT, Ghaghraghat,
Bahraich, Uttar Pradesh, India

SKS Rajpoot
Crop Research Station,
ANDUAT, Ghaghraghat,
Bahraich, Uttar Pradesh, India

RA Singh
Crop Research Station,
ANDUAT, Ghaghraghat,
Bahraich, Uttar Pradesh, India

Corresponding Author:
SP Giri
Crop Research Station,
ANDUAT, Masodha, Ayodhya,
Uttar Pradesh, India

Collection and evaluation of Kalanamak rice germplasm from traditional Kalanamak Agromorphological characters of eastern Uttar Pradesh

SP Giri, Saurabh Dixit, V Prasad, DK Diwedi, N Prakash, SKS Rajpoot and RA Singh

DOI: https://doi.org/10.22271/chemi.2021.v9.i1b.11436

Abstract
A field experiment was conducted at Crop Research Station, Masodha, Faizabad to agro morphologically characterize the ninety five aromatic short grain rices Kalanamak of diverse origin, collected from different districts of eastern Uttar Pradesh *viz*: Maharajganj, Sidharth Nager, during kharif 2017 and 2018. The 40 DUS characters are, (1) Basal leaf sheath colour (2) Leaf pubescence of Blade surface (3) Leaf auricles (4) Leaf anthocyanin colouration of auricles (5) Ligule shape (6) Ligule colour (7) Days to 50% flowering (8) Flag leaf attitude of blade early obs (9) Spikelet density of pubescence of lemma (10) Lemma anthocyanin colouration of area below apex (11) Spikelet color of stigma (12) Stem length (13) Stem anthocyanin colouration of nodes (14) Panicle Length (15) Flag leaf attitude of blade late obs (16) Panicle curvature of main axis (17) Spikelet colour of tip of lemma (18) Panicle awns (19) Panicle color of awns late obs (20) Panicle distribution of awns (21) Panicle attitude of branches (22) Panicle exertion (23) Sterile lemma colour (24) Decorticated grain length (25) Decorticated grain width (26) Decorticated grain shape (27) Decorticated grain color (28) Endosperm presence of amylose (29) Decorticated grain aroma (30) Vegetaive vigour (31) Tillering ability (32) Productive tillers/Plant (33) Plant Height (34) Panicle threshability (35) Phenotypic acceptability (36) Spikelet number plant (37) Fertile Grains Plant (38) Sterile grains /Plant (39) Plot Yield in gms (40) 100 Grain weight. Yield kg/ha ranged from 1110 to 3250 kg/ha. The promising germplasm grain yield kg/ha was Kalanamak Nichlol (A) is 3250 kg/ha followed by Kalanamak Birdpur (C) 3160 kg/ha, Kalanamak Aligarh 3110 kg/ha, Kalanamak Kapilvastu 3090 kg/ha. Specialty rice, in general, and aromatic rice in particular, possess enormous market potential for enhancing farm profits. However, systematic characterization of the diversity present in this natural wealth is a major pre requisite for using it in the breeding programs. This study reports qualitative phenotypic trait based characterization of 95 short grain aromatic Kalanamak rice genotypes, collected from different areas of the state of U.P., India.

Keywords: Genetic diversity, germplasm collection, UP, landraces, rice

Introduction

Rice is an important cereal crop, grown under diverse agro-ecological conditions. It is one of the very few crop species endowed with rich genetic diversity which account over one lakh landraces and improved cultivars (Samal, 2014) [17]. The success of any breeding programmes depends upon the genetic variability present among populations. Genetic uniformity is an alarming situation among new rice varities (Morishima and Oka 1995) [12] as it increases the chance of disease epidemics and insect infestation. Genetic divergence among the genotypes plays an important role in the selection of parents having wider variability for different yield and quality characters (Sarawgi and Binse, 2007) [5] which may be useful for breeding programmes. Rice is a traditional staple food in many countries of the world, importantly in Asian countries, therefore rice consumption is determined by the population needs in food. Rice (*Oryza sativa* L.) is a monocot grass species and belongs to Gramene family and Oryza genus which originated at least 130 million years ago (Khush, 1997) [10, 20]. Domestication of rice simultaneously (probably) observed in north east part of India and southern region of china about 800 years ago (Sang and Ge, 2007) [10].

International Journal of Chemical Studies 2020; SP-9(1): 85-90

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902

IJCS 2021; SP-9(1): 85-90
© 2021 IJCS
Received: 17-11-2020
Accepted: 21-12-2020

SP Giri
Crop Research Station, ANDUAT, Masodha, Ayodhya, Uttar Pradesh, India

Saurabh Dixit
Crop Research Station, ANDUAT, Masodha, Ayodhya, Uttar Pradesh, India

V Prasad
Crop Research Station, ANDUAT, Masodha, Ayodhya, Uttar Pradesh, India

DK Diwedi
Crop Research Station, ANDUAT, Masodha, Ayodhya, Uttar Pradesh, India

N Prakash
Crop Research Station, ANDUAT, Ghaghraghat, Bahraich, Uttar Pradesh, India

SKS Rajpoot
Crop Research Station, ANDUAT, Ghaghraghat, Bahraich, Uttar Pradesh, India

RA Singh
Crop Research Station, ANDUAT, Ghaghraghat, Bahraich, Uttar Pradesh, India

Corresponding Author:
SP Giri
Crop Research Station, ANDUAT, Masodha, Ayodhya, Uttar Pradesh, India

Collection and evaluation of Kalanamak rice germplasm from traditional Kalanamak Agromorphological characters of eastern Uttar Pradesh

SP Giri, Saurabh Dixit, V Prasad, DK Diwedi, N Prakash, SKS Rajpoot and RA Singh

DOI: https://doi.org/10.22271/chemi.2021.v9.i1b.11436

Abstract
A field experiment was conducted at Crop Research Station, Masodha, Faizabad to agro morphologically characterize the ninety five aromatic short grain rices Kalanamak of diverse origin, collected from different districts of eastern Uttar Pradesh *viz*: Maharajganj, Sidharth Nager, during kharif 2017 and 2018. The 40 DUS characters are, (1) Basal leaf sheath colour (2) Leaf pubescence of Blade surface (3) Leaf auricles (4) Leaf anthocyanin colouration of auricles (5) Ligule shape (6) Ligule colour (7) Days to 50% flowering (8) Flag leaf attitude of blade early obs (9) Spikelet density of pubescence of lemma (10) Lemma anthocyanin colouration of area below apex (11) Spikelet color of stigma (12) Stem length (13) Stem anthocyanin colouration of nodes (14) Panicle Length (15) Flag leaf attitude of blade late obs (16) Panicle curvature of main axis (17) Spikelet colour of tip of lemma (18) Panicle awns (19) Panicle color of awns late obs (20) Panicle distribution of awns (21) Panicle attitude of branches (22) Panicle exertion (23) Sterile lemma colour (24) Decorticated grain length (25) Decorticated grain width (26) Decorticated grain shape (27) Decorticated grain color (28) Endosperm presence of amylose (29) Decorticated grain aroma (30) Vegetative vigour (31) Tillering ability (32) Productive tillers/Plant (33) Plant Height (34) Panicle threshability (35) Phenotypic acceptability (36) Spikelet number/plant (37) Fertile Grains /Plant (38) Sterile grains /Plant (39) Plot Yield in gms (40) 100 Grain weight. Yield kg/ha ranged from 1100 to 3250 kg/ha. The promising germplasm grain yield kg/ha was Kalanamak Nichlol (A) is 3250 kg/ha followed by Kalanamak Birdpur (C) 3160 kg/ha, Kalanamak Aligarh 3110 kg/ha, Kalanamak Kapilvastu 3090 kg/ha. Specialty rice, in general, and aromatic rice in particular, possess enormous market potential for enhancing farm profits. However, systematic characterization of the diversity present in this natural wealth is a major pre requisite for using it in the breeding programs. This study reports qualitative phenotypic trait based characterization of 95 short grain aromatic Kalanamak rice genotypes, collected from different areas of the state of U.P., India.

Keywords: Genetic diversity, germplasm collection, UP, landraces, rice

Introduction
Rice is an important cereal crop, grown under diverse agro-ecological conditions. It is one of the very few crop species endowed with rich genetic diversity which account over one lakh landraces and improved cultivars (Samal, 2014) [17]. The success of any breeding programmes depends upon the genetic variability present among populations. Genetic uniformity is an alarming situation among new rice varities (Morishima and Oka 1995) [12] as it increases the chance of disease epidemics and insect infestation. Genetic divergence among the genotypes plays an important role in the selection of parents having wider variability for different yield and quality characters (Sarawgi and Binse, 2007) [8] which may be useful for breeding programmes. Rice is a traditional staple food in many countries of the world, importantly in Asian countries, therefore rice consumption is determined by the population needs in food. Rice (*Oryza sativa* L.) is a monocot grass species and belongs to Gramene family and Oryza genus which originated at least 130 million years ago (Khush, 1997) [10, 20]. Domestication of rice simultaneously (probably) observed in north east part of India and southern region of china about 800 years ago (Sang and Ge, 2007) [10].

Int.J.Curr.Microbiol.App.Sci (2020) 9(12): 1944-1948

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 12 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.912.231

Documentation Variation for Alternaria Blight Resistance in Diversity Stock of Indian Mustard (*Brassica juncea* (L) Czern and Coss)

Sumant Pratap Singh[1*], N. A. Khan[1], Reeshu Singh[1], H. K. Singh[2], S. Prasad[1] and D. K. Dwivedi[1]

[1]*Department of Plant Molecular Biology and Genetic Engineering,* [2]*Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, (U.P), India*

**Corresponding author*

Keywords

Alternaria Indian mustard, Disease resistance, Genotypes

Article Info

Accepted:
11 November 2020
Available Online:
10 December 2020

ABSTRACT

In the present investigation 234 Indian mustard germplasm were screened in infested field against major disease of Indian mustard. Out of 234 Brassica germplasm, these screening was not found immune or highly resistant and resistance against Alternaria blight. Seven genotypes viz., PRG-909, CN-107719, CM-8, PRG-2001-62, LM-114-6, Bio-179, Bio-169-95 were found moderately resistant with disease severity of 5-10 percent were rated as moderately susceptible were found 114 genotypes with disease severity 11-25 percent. 131 genotypes were marked as susceptible in which disease severity was found to be 26 to 50 percent. The highly susceptible only two genotypes was found to be >50 present with disease severity respectively.

Introduction

Indian mustard (*Brassica juncia* (L.) Czern and Coss) is the third important oil seed crop in the world after soybean (*Glycine max* L.) and palm (*Elaeis guineensis* Jacq.) oil. It is grown in subtropical and tropical countries in theworld comprise eight cultivated crops of tribe *Brassiceae* within the family Cruciferae (*Brassicaceae*). In India, it is the second most important edible oil seed after groundnut and sharing 27.8% in the India's oilseed production. The oil of the Rapeseed mustard is mainly used in human diet. The crop also has important place in industrial uses such as for manufacturing soap, paints, varnishes, hair oil, lubricants, textile auxiliaries and various other products. Indian mustard [*Brassica juncea* (L.) Czern and Coss.] is predominantly cultivated in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh and Gujarat. Among these states, Rajasthan, Uttar Pradesh and Madhya Pradesh hare the major Rapeseed-mustard growing state to the national acreage during The corresponding contribution to production was 48.6%, 13.4%

Int.J.Curr.Microbiol.App.Sci (2020) 9(12): 1944-1948

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 12 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.912.231

Documentation Variation for Alternaria Blight Resistance in Diversity Stock of Indian Mustard (*Brassica juncea* (L) Czern and Coss)

Sumant Pratap Singh[1*], N. A. Khan[1], Reeshu Singh[1], H. K. Singh[2], S. Prasad[1] and D. K. Dwivedi[1]

[1]Department of Plant Molecular Biology and Genetic Engineering, [2]Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, (U.P), India

**Corresponding author*

Keywords

Alternaria, Indian mustard, Disease resistance, Genotypes

Article Info

Accepted:
14 November 2020
Available Online:
10 December 2020

ABSTRACT

In the present investigation 234 Indian mustard germplasm were screened in infested field against major disease of Indian mustard. Out of 234 Brassica germplasm, these screening was not found immune or highly resistant and resistance against Alternaria blight. Seven genotypes viz., PRG-909, CN-107719, CM-8, PRG-2001-62, LM-114-6, Bio-179, Bio-169-95 were found moderately resistant with disease severity of 5-10 percent were rated as moderately susceptible were found 114 genotypes with disease severity 11-25 percent. 131 genotypes were marked as susceptible in which disease severity was found to be 26 to 50 percent. The highly susceptible only two genotypes was found to be >50 present with disease severity respectively.

Introduction

Indian mustard (*Brassica juncia* (L.) Czern and Coss) is the third important oil seed crop in the world after soybean (*Glycine max* L.) and palm (*Elaeis guineensis* Jacq.) oil. It is grown in subtropical and tropical countries in theworld comprise eight cultivated crops of tribe *Brassiceae* within the family Cruciferae (*Brassicaceae*). In India, it is the second most important edible oil seed after groundnut and sharing 27.8% in the India's oilseed production. The oil of the Rapeseed mustard is mainly used in human diet. The crop also has important place in industrial uses such as for manufacturing soap, paints, varnishes, hair oil, lubricants, textile auxiliaries and various other products. Indian mustard [*Brassica juncea* (L.) Czern and Coss.] is predominantly cultivated in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh and Gujarat. Among these states, Rajasthan, Uttar Pradesh and Madhya Pradesh hare the major Rapeseed-mustard growing state to the national acreage during The corresponding contribution to production was 48.6%, 13.4%

International Journal of Chemical Studies 2020; 8(4): 1397-1400

International Journal of Chemical Studies

...: 2349-8528
...: 2321-4902

...20; 8(4): 1397-1400
...20 IJCS
...ed: 01-05-2020
...pted: 05-06-2020

...t Pratap Singh
...artment of Plant Molecular ...netic Engendering, A. N. ...niversity of Agriculture and ...ology, Kumarganj, ...nya, Uttar Pradesh, India

...an
...artment of Plant Molecular ...netic Engendering, A. N. ...niversity of Agriculture and ...ology, Kumarganj, ...ya, Uttar Pradesh, India

...Singh
...artment of Plant Molecular ...netic Engendering, A. N. ...niversity of Agriculture and ...ology, Kumarganj, ...ya, Uttar Pradesh, India

...ngh
...artment of Plant Pathology, ...D. University of ...lture and Technology, ...marganj Ayodhya, Uttar ...sh, India

...rasad
...tment of Plant Molecular ...Genetic Engendering, A. N. ...niversity of Agriculture and ...ology, Kumarganj, ...dhya, Uttar Pradesh, India

Dwivedi
...tment of Plant Molecular ...Genetic Engendering, A. N. ...niversity of Agriculture and ...ology, Kumarganj, ...dhya, Uttar Pradesh, India

...sponding Author:
...ant Pratap Singh
...rtment of Plant Molecular ...Genetic Engendering, A. N. ...niversity of Agriculture and ...nology, Kumarganj, ...dhya, Uttar Pradesh, India

Documentation variation for Alternaria blight resistance in varieties of Rapeseed mustard

Sumant Pratap Singh, NA Khan, Reeshu Singh, HK Singh, S Prasad and DK Dwivedi

DOI: https://doi.org/10.22271/chemi.2020.v8.i4m.9793

Abstract

The study was conducted with the objective to assess the resistance source against blight in rapeseed-mustard at Student's Instruction Farm, Acharya Narender Deva University of Agriculture and Technology Kumarganj Ayodhya (U.P.) during *Rabi* 2018-19. Screening of Indian mustard 47 genotypes, these screening was not found highly resistant, resistant and moderately resistance against Alternaria blight of rapeseed mustard six genotypes *viz*., Kiran, TMR-14-6, TMR-14-1, TMR-14-5, TMR-14-3, TMR-14-4 with disease severity of 5-10 per cent respectively were rated as moderately susceptible were found nine genotypes with disease severity 11-25 percent. 31genotypes were marked as susceptible in which disease severity was found to be 26 to 50%. The highly susceptible only one genotypes was found to be >50 present with disease severity respectively. It could be noticed that the vulnerability level was relatively quite high as compared to resistance status.

Keywords: Rapeseed- mustard, Alternaria blight, disease reaction, screening

Introduction

Brassica species are the largest oilseed crop in the world oilseed production followed by peanut (*Arachis hypogaea* L.) and sunflower (*Helianthus annus* L.). In India, rapeseed-mustard is grown over in diverse agroclimatic conditions ranging from north-eastern/north-western hills to down south. These crops require cool growing season and moderate temperature throughout, hence are sown in the month of 1 November to 15 November in northern India (Das *et al.*, 2009) [4].

Brassica juncea (L.) Czern & Coss., also known by the name of Indian mustard, belongs to the plant family *Brassiceae* (*Cruciferae*) or the mustard family. It is commonly referred to as Rapeseed-mustard along with four other closely related cultivated oilseed species *viz*. *B. rapa*, *B. napus*, *B. carinata* and *Eruca sativa*. Indian mustard is largely self pollinated. Indian mustered (*B. juncea* L. czern and coss). popularly known as rai, raya or laha is one of the most important oil seed crop of the country. *Brassica juncea* (n = 18) is an amphidiploid species derived from interspecific crosses between *B. nigra* (n = 9) and *B. rapa* (n = 10).

Rapeseed mustard are the world's third most important sources of vegetable edible oil. It also contains adequate amounts of the two essential fatty acids, linoleic and linolenic, which are not present in many of the other edible oils. The oil is also used as hair oil and as lubricant. A peculiar use of mustard oil is to retard the fermentation process when making cider from apples. Vegetable oils and fats are valuable food ingredients in human diet. They contain saturated and unsaturated fatty acids. The Indian mustard have nutritional value *viz*., carbohydrates 4.51g, sugar 1.41g, dietary fiber 2g, fat 0.47g and protein 2.56g per 100 g (3.5 oz). It is a good source of protein (28-36%).

The tender leaves of these cultivars serve as vegetable, while the seeds as a source of lubricating and cooking oil. The residue left after oil extraction being rich in protein (Durrani and Khalil, 1990; Chattopadhyay *et al.*, 2005) [6, 1] can be used as livestock feed. It produces 9 k cal energy from 1gm of oil per unit in comparison with other diets (carbohydrate and Protein). Mustard seeds have relatively high protein content (28-36%). Until now mustard seeds have been used mainly for condiment production. (Gadei *et al.*, 2012) Mustard oil contains a high amount of selenium and magnesium, which gives it anti-inflammatory properties.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902

IJCS 2020; 8(4): 1776-1779
© 2020 IJCS
Received: 13-05-2020
Accepted: 16-06-2020

Anuj Kumar
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

DK Dwivedi
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Pratibha Yadav
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Rahul Kumar
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Preeti Kumari
Department of Genetics and Plant Breeding, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Archana Devi
Department of Genetics and Plant Breeding, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

NA Khan
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Anuj Kumar
Department of Plant Molecular Biology & Genetic Engineering, A.N.D. University of Agriculture & Technology, Kumar Ganj, Ayodhya, Uttar Pradesh, India

Screening of rice (*Oryza sativa* L.) for salinity tolerance at seedling stage under hydroponic condition

Anuj Kumar, DK Dwivedi, Pratibha Yadav, Rahul Kumar, Preeti Kumari, Archana Devi and NA Khan

DOI: https://doi.org/10.22271/chemi.2020.v8.i4e.9875

Abstract
Rice is one among the foremost suitable crop for saline soils although it's usually considered moderately sensitive to salinity. The phenotypic response of twenty rice genotypes with salt stress at EC=12 dsm^{-1} was assessed under hydroponic condition at seedling stage. The rice genotypes FL-478, IR68144-2B-2-2-3-1-120, IR-68144-2B-2-2-3-1-127 were found tolerant, while IR-91167-99-1-1- 1-3, NUD-3, NUD-2, CSR-13, IR-92953-49-1-3 and NDRK-2008 showed moderately tolerant to salinity and genotypes NDR-359, MTU-1010, TARAMON, SAMBHA MANSURI, SWARNA IR-28 and AYYAR showed vulnerable to salinity. Tolerant varieties are suggested to use as donor parents for salinity tolerance in back cross breeding and for allele mining for salinity tolerance gene/QTLs.

Keywords: QTL: qualitative trait loci, Allele: contrasting pair of gene, EC: electrical conductivity, Hydroponic condition: soil-less culture

Introduction
The plant response to salinity consists of various processes that must function in coordination to enhance both cellular hyperosmolarity and ion disequilibrium. Salt stress adversely affects agricultural yield throughout the world affecting production. Many species of higher plants, including most crops, are subjected to growth inhibition under high-NaCl condition. Rice is one among the foremost suitable crop moderately sensitive to salinity (Akbar *et al.*, 1972)[3]. It is relatively tolerant to salinity at the germination stage but its panicle initiation and pollination stage are two most salinity-sensitive growth stages which is directly related to crop yield (Heenan *et al.*, 1988, Khatun and Flower, 1995, Zeng *et al.*, 2001)[4, 5, 10]. Screening of rice genotypes at seedling stage is comparatively easier than reproductive stage and also rapid. It is very difficult at the reproductive stage (Gregario *et al.*, 1997)[2]. The typical mechanism of salinity tolerance in rice is that the exclusion or reduction of Na uptake and increased absorption of K to take care of an honest Na^+-K^- balance within the shoot. Salt injury starts with reduction in effective leaf area. The oldest leaves start to roll then die, followed by the next older, and so on. Rice is extremely sensitive to salinity at seedling stage. Its height, root length, emergence of latest roots and dry matter decreases significantly at EC 5-6 dSm^{-1} (Pearson *et al.*, 1966, Akbar and Yabuno., 1974)[7, 1]. Salinity suppresses leaf elongation and formation of latest leaves. The screening technique is based on the ability of seedling to flourish in salinized nutrient solution.

Materials and Methods
Plant materials
Total twenty rice genotypes were used in this study, which were IR68144-2B-2-2-3-1-120, IR-68144-2B-2-2-3-1-127, IR-91167-99-1-1-1-3, IR-91167-133-1-1-2-3, NUD-3, NDR-359, IR-28, FL-478, NUD-2, CSR-13, AYYAR, NDRK-2008, IR-64, SWARNA, IR-92953-49-1-3, IR-91171-66-3-2-1-3, IR-83668-35-2-2-2, SAMBHA MANSURI, TARAMON and MTU-1010.

Int.J.Curr.Microbiol.App.Sci (2020) 9(7): 1851-1855

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 9 Number 7 (2020)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2020.907.213

Assessment of Antagonistic Activity in PGPR Isolates against *Alternaria solani* causing Early Blight of Potato

Ashutosh Tiwari[1], Adesh Kumar[1*], Minakshi[1], Shambhoo Prasad[1], D. K. Dwivedi[1], N. A. Khan[1], Arun Kumar[2], Ved Prakash[3], Jaipal[4], Sushil Kumar Singh[5], Pankaj Kumar[6] and Abhimanyu Yadav[7]

[1]*Department of Plant molecular Biology and Genetic Engineering, ANDUAT Kumarganj, Ayodhya -224229, India*
[2]*PBR Agriculture college, Gausganj, Hardoi, India*
[3]*Department of Soil Science, ANDUAT, Kumarganj, Ayodhya -224229*
[4]*UPCAR, Lucknow, India*
[5]*Department of Plant Pathology, ANDUAT Kumarganj, Ayodhya -224229, India*
[6]*Directorate of Extension, ANDUAT Kumarganj, Ayodhya -224229, India*
[7]*Department of Soil Science & Agril Chemistry, P G. College Ghazipur U.P India*

**Corresponding author*

Keywords
Antagonistic Activity, Alternaria solani Early Blight of Potato

Article Info

Accepted:
17 June 2020
Available Online:
10 July 2020

A B S T R A C T

In the present study, the fungus was isolated from infected leaf of potato and identified as *Alternaria solani*. Twenty four bacterial strains isolated from potato rhizosphere on PDA media. The screening of all 24 potato rhizosphere isolates for IAA, phosphate solubilization, Insecticide tolerance, salt tolerance, antibiotic sensitivity and ammonia production was performed. Out of these isolates, only four isolates (5, 15, 16 and 23) showed high inhibitory effect on the pathogenic fungus in dual culture. PGPR isolate no 5 showed highest 95% inhibition against *Alternaria solani*.

Introduction

Potato (*Solanum tuberosum* L.) is one of the world's most important food crops, and is grown in more than 100 countries with different climate conditions including temperate, subtropical and tropical zones. There are several diseases in potato caused by fungi, bacteria, viruses, nematodes and abiotic factors. Among which an early blight caused by *Alternaria solani* has been known to cause yield losses up to 80% (Martin, 1986). The disease manifests as leaf spots with dark brown to black concentric ring which later enlarge and result in blighting of leaves and fruits. The dark spot and sunken lesions also

Int.J.Curr.Microbiol.App.Sci (2020) 9(7): 2714-2721

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 9 Number 7 (2020)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2020.907.320

Evaluation of Rice Genotypes for Genetic Variability, Heritability and Genetic Advance in Saline and Normal soil Conditions

Anuj Kumar[1*], D. K. Dwivedi[1], Pradeep K. Bharti[1], Vineeta Singh[1], Preeti Kumari[2], Archana Devi[2], and N. A. Khan[1]

[1]Department of Plant Molecular Biology & Genetic Engineering, [2]Department of Genetics and Plant Breeding, A. N. D. University of Agriculture & Technology, Kumar Ganj, Ayodhya-224229, India

**Corresponding author*

Keywords

Genetic variability, Heritability, Genetic advance, Rice (*Oryza sativa* L.)

Article Info

Accepted:
22 June 2020
Available Online:
10 July 2020

ABSTRACT

The present investigation was carried out with the objectives to estimate genetic variability for yield and yield contributing components. The investigation consisted of twenty rice genotypes and the experiment was conducted during Kharif-2018-19 in Randomized Block Design with three replications. The data were recorded for fourteen quantitative characters to study genetic variability, heritability and genetic advance. Analysis of variance among twenty genotypes showed significant difference for all characters under studied. Highest genotypic coefficient of variation (GCV) and phenotypic coefficient variation (PCV) was observed for grains per panicle followed by panicle bearing tillers per plant and spikelets per panicle in controlled condition, whereas, in saline condition highest genotypic coefficient of variation (GCV) and phenotypic coefficient variation (PCV) was observed for panicle bearing tillers per plant followed by grains per panicle and spikelets per panicle. These characters could be used as selection parameters for crop improvement. High estimates of heritability were observed for K^+ followed by plant height, days to 50% flowering, harvest index% and grains per panicle in normal soil condition, whereas, in saline condition highest broad sense heritability was recorded in the case of plant height, spikelets per panicle followed by days to 50% flowering, grains per panicle, K^+ and harvest index %. In controlled condition high genetic advance were observed for grains per panicle followed by spikelets per panicle, whereas, in saline condition maximum genetic advances was recorded in grains per panicle followed by panicle bearing tillers per plant. It indicated that the presence of additive gene action. Hence, emphasis should be given to select these quantitative traits to enhance the yield potential of rice (*Oryza sativa* L.) under both conditions.

Introduction

Rice (*Oryza sativa* L.) is a diploid (2n = 24) and self-fertilized monocot. There are two species of cultivated rice - *Oryza sativa* and *Oryza glaberrima*. *Oryza sativa* is the rice cultivated in majority of rice growing countries. As a food crop, it forms the staple food of more than three billion people accounting for about 50-80% of their daily

Int.J.Curr.Microbiol. App.Sci (2020) 9(8): 3964-3970

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 8 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.908.456

Analysis of Leaf and Seed Protein of Pigeonpea Genotype (*Cajanus cajan* L. Millspaugh) Including One Wild Species Revealed by Gel Electrophoresis

Bavita Yadav*, N. A. Khan, Tanvi Chauhan, Pratibha Yadav and D. K. Dwivedi

Department of PMB & GE, A. N. D. University of Agriculture & Technology, Kumarganj, Ayodhya (224229), India

**Corresponding author*

Keywords

Pigeonpea, *Cajanus scarabaeoides*, SDS-PAGE

Article Info

Accepted:
28 July 2020
Available Online:
10 August 2020

A B S T R A C T

Pigeonpea is the major source of dietary protein for vegetarian population in India and other developing countries. The following study was taken to understand the genetic relationship between genotypes on the basis of protein profiling of leaves and seed protein. Ten genotypes of Pigeon pea [*Cajanus cajan* (L.) Millspaugh] including one wild species was sown in the field at Student Instructional Farm, ANDUA & T Kumarganj Ayodhya. Total protein was extracted using 0.1 M Sodium phosphate buffer (pH 7.2) containing NaH_2PO_4 and Na_2HPO_4. Protein was electrophoresed on 12% SDS- PAGE along with standard protein marker and detected by commassive brilliant blue staining. Pigeonpea leaves and seeds protein showed variability in banding pattern of polypeptide on gel. RM values of different pigeonpea genotype were measured. The results showed that both leaves and seeds protein migrated between a range of < 10 to 250 kDa. NDA-3, MAL-6 and MAL-13 had minimum protein bands (8 bands) while maximum protein bands was observed in NDA-14-6 (12 bands) in leaves. In protein profile of seeds it has been seen that *Cajanus scarabaeoides* showed maximum bands (20 bands) while NDA-2 showed minimum protein band (11). All the accessions commonly showed at least six major bands in leaves while 11 major bands in seeds. In this context we can say that seeds of wild genotype contain more protein than cultivated pigeonpea genotype. The main objective of this study is to reveal intra-specific similarities and genetic diversity in protein content amongst ten genotypes of pigeon pea.

Introduction

The pigeon pea [*Cajanus cajan* (L.) Millspaugh] is an often cross-pollinated diploid (2n = 2x = 22) crop with genome size 833.07 Mb belongs to the family Fabaceae. It is an important grain legume crop of rain fed agriculture in the tropical and sub-tropical regions of the world. It is the first seed legume which has been complete genome sequenced (Singh *et al*., 2012; Varshney *et al*., 2012). Pigeon peas production is estimated at 4.49 million tons in world (FAOSTAT 2018). In India Pigeonpea production is 4.25 Million tons in a total area of 4.43 Mha at productivity level of 960 kg ha (ever highest yield) during 2017-18 (DES 2018).

Pigeon pea seeds are a rich source of protein and are widely consumed by people in developing countries to meet their caloric and protein needs (Salunkhe *et al*., 1986; Singh *et al*., 1990). Due to high protein content (18–

Current Journal of Applied Science and Technology

39(13): 54-62, 2020; Article no.CJAST.55944
ISSN: 2457-1024
(Past name: British Journal of Applied Science & Technology, Print ISSN: 2231-0843
NLM ID: [illegible])

Evaluation of Rice Genotypes for Salinity Tolerance at Reproductive Stage Using Phenotypic and Molecular Markers

[illegible] Kumar[1*], D. K. Dwivedi[1], Pradeep K. Bharti[1], Vinerta Singh[1], Vikas Singh[1], Preeti Kumari[2] and N. A. Khan[1]

[1]Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224229, India
[2]Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224229, India

Authors' contributions

This work was carried out in collaboration among all authors. Author [illegible] designed the study [illegible] the protocol and [illegible] the first draft of the [illegible]. Authors DKD and PKB managed the analyses of the study. Authors Vinerta Singh, Vikas Singh, PK and NAK managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: [illegible]
[illegible]
(1) Dr. [illegible] Ranjan, Bihar Agricultural University, [illegible]
[illegible]
1) [illegible], Biotechnology Research Institute, Chinese Academy of Agricultural Sciences, China.
(2) Adewusi Olamide Folake, Federal University of Technology, Akure (FUTA), Nigeria.
Complete Peer review History: http://www.[illegible]/review-history/[illegible]

Original Research Article

Received 09 March 2020
Accepted 14 May 2020
Published 03 June 2020

ABSTRACT

Rice is the single largest [illegible] food [illegible] for more than half of the world's population. Salinity may be a serious environmental constraint to crop production. Salinity [illegible] rice genotypes were performed at the reproductive stages in the net house of department of PMB&GE. Phenotyping of the genotypes was done at EC 12dS/m at reproductive stage in net house. Most desirable genotypes days to 50% flowering were IR-68144-2B-2-3-1-120, CSR-13, FL-478, NDR-359, AYYAR and NUD-2, SAMBHA MANSURI and MTU-1010 for plant height IR-68144-2B-2-2-3-1-127, NUD-3, NUD-2, NDRK-2003, IR-91171-66-3-2-1-3, SAMBHA MANSURI, [illegible] MTU-1010, for panicle bearing tillers/plant FL-478, NDR-359 and SWARNA, for panicle length IR-68144-2B-2-2-3-1-127, IR-91167-99-1-1-1-3, IR-29, FL-478, NDRK-2003 and IR-92952-[illegible]-1-3, for spikelets/panicle IR-91167-99-1-1-1-3, NDRK-2003, SWARNA, IR-92952-49-1-3, IR-91171-66-3-2-1-3, IR-82668-35-2-2-2 and MTU-1010, for grains/panicle SWARNA, IR-92952-49-1-3, IR-91171-66-

*Corresponding author: E-mail: ak87675@gmail.com

Current Journal of Applied Science and Technology

39(9): 33-39, 2020; Article no.CJAST.56930
ISSN: 2457-1024
(Past name: British Journal of Applied Science & Technology, Past ISSN: 2231-0843, NLM ID: 101664541)

Genetic Divergence Analysis of Rice Genotypes under Salt Stress Environment

Anuj Kumar[1*], D. K. Dwivedi[1], Pradeep K. Bharti[1], Shivani[1], Preeti Kumari[2], Archana Devi[2] and N. A. Khan[1]

[1]Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumar Ganj, Ayodhya, 224229, India.
[2]Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumar Ganj, Ayodhya, 224229, India.

Authors' contributions

This work was carried out in collaboration among all authors. Author AK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors DKD and PKB managed the analyses of the study. Authors Shivani, PK, AD and NAK managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2020/v39i930604
Editor(s):
(1) Dr. Orlando Manuel da Costa Gomes, Lisbon Accounting and Business School (ISCAL) - Lisbon Polytechnic Institute, Portugal.
Reviewers:
(1) Qi Cheng, Biotechnology Research Institute, Chinese Academy of Agricultural Sciences, China.
(2) Aba-Toumnou Lucie, University of Bangui, Central African Republic.
Complete Peer review History: http://www.sdiarticle4.com/review-history/56930

Original Research Article

Received 28 February 2020
Accepted 05 May 2020
Published 08 May 2020

ABSTRACT

The present investigations were conducted in randomized block design with three replications within the net house of the department of PMB&GE, A. N.D.U.A.T, Kumar Ganj, Ayodhya to estimate the genetic divergence under normal and salt stress conditions involving 20 rice genotypes during Kharif 2018-19, on the basis of relative parameters of D^2 values, the clustering pattern of 20 rice genotypes under normal and salt stress conditions were grouped into five non-overlapped clusters. Under normal condition, Cluster III having highest 7 rice genotypes, Cluster II having 5 genotypes, cluster V having 4 genotypes and IV having highest 3 rice genotype. Cluster I having only one genotype. Under saline condition, Cluster I having highest rice 6 genotypes, cluster III having 5 genotypes and cluster II & IV having 4 genotypes respectively. Cluster V having only one genotype. It means the genetic similarity was found in the genotypes were expressed within the cluster and the pattern of distribution of genotypes in various clusters exhibited that topographical diversity wasn't

**Corresponding author: E-mail: ak87675@gmail.com;*

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-10: 290-296

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-10 pp. 290-296
Journal homepage: http://www.ijcmas.com

Original Research Article

Identification of Rice Genotypes for Submergence and Yield Attributing Traits

Saurabh Dixit[1*], S.P. Giri[1], V. Prasad[1], S.K.S. Rajpoot[1], A.K.Singh[2], Alok Kumar Singh[2] and D.K. Dwivedi[1]

[1]Crop Research Station, (ANDUAT), Masodha, Ayodhya, India
[2]A.N.D.U.A.T. Kumarganj, Ayodhya, India

**Corresponding author*

A B S T R A C T

Altogether 334 rice lines alongwith8 global check varieties were tested for submergence survival and yield performance at Crop Research Station, Masodha, Ayodhya. These lines and check varieties, namely IR 64-Sub 1, Swarna-sub 1, Sambha Mahsuri-Sub 1, Ciherang-Sub1, TDK1, Ciherang, RC18, SambhaMahsuri and 3 local check viz. Swarna, MTU 1010 and Sahabagidhan were laid out in augmented design with 10 blocks. For survival testing in submergence, the experiment was conducted in the submergence pool and for yield performance (optimal condition), the experiments was conducted in the irrigation field. Each entry was direct sown in two rows of 3 meter length and after 25 days of sowing complete submergence of one meter water depth was imposed for 20 days. Data recorded for submergence survival as no. of plant counted before and after submergence. In yield performance experiments observation recorded on days to 50% flowering, plant height, Ebt/m2, total biomass, harvest index and yield kg/ha. Among 334 lines none of the lines have recorded 100% survival however, eight lines viz., TTB 944-31-10-1-2 (95.2%), CR-2859-1-S-B-2-1-B-B-5-1 (94.7%), IR103410-B-B-2-3 (87.5%), CR 2851-S-1-B-4-1-4-1-1 (IET27051) (84.2%), IR 97034-21-2-1-3 (69.6%), IR09A130 (66.7), CR 2859-S-B-2-1-B-7-1 (60%) and NSIC 2016 RC 468 (57.9%) survived and 42 lines falls under 20-56 % survival, were recorded. The entries were selected on the basis of (i) selection based on survival % and vigor, (ii) selection based on productivity under submergence, (iii) selection based on the variables of morphological and agronomic characters. The entry IR103410-B-B-2-3 (87.5%) (4667 kg/ha),IR 97034-21-2-1-3 (69.6%)(4667 kg/ha),TTB 944-31-10-1-2(95.2%) (4000 kg/ha) and NSIC 2016 RC 468 (57.9%) (3333 kg/ha) also good for survival and yield. These lines are considered promising for tolerant to submergence as well as yield.

Keywords

Rice, Lines, Survival percentage, Submergence, Water depth and Yield

Introduction

Rice (*Oryza sativa* L.) is one of the most important crops of the world and provides food to more than 50% global population. More than 90% of the world's rice is grown and consumed in Asia, where 60% of the earth's people live. It was estimated that 35-60% of the calories consumed by 3 billion Asians comes from rice. Rice demand in

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-10: 297-301

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-10 pp. 297-301
Journal homepage: http://www.ijcmas.com

Original Research Article

Impact Analysis of Front Line Demonstration of Rice in Eastern Uttar Pradesh

S.P. Giri[1*], Saurabh Dixit[1], D.K. Verma[1], C.P. Singh[2], N. Parkash[3], S.K.S. Rajpoot[1], V. Prasad[1], D.K. Dwivedi[1], A.K. Singh[1] and C.B. Singh[1]

[1]Crop Research Station, (ANDUAT), Masodha, Ayodhya, India
[2]Crop Research Station, (ANDUAT), Bara Bag, Gazipur, India
[3]Crop Research Station, (ANDUAT), Ghaghraghat, Bahraich, India

**Corresponding author:*

A B S T R A C T

Technological and extension gap of yield and profitability can be bridges by adopting package of practices with emphasis of improved variety, use of proper seed rate, balance nutrient application and proper use of plant protection measures. The study was carried out through front line demonstrations during Kharif season of 2017 and 2018 in three adopted district and sixteen village of Ayodhya, Gonda and Azamgarh on farmers field with the active participation of farmers with an objective to evaluate the performances of improved technology of high yielding rice variety Sambha Mahsuri-Sub 1 and compared to the local check (Sambha Mahsuri). The Sambha Mahsuri-Sub 1 recorded grain yield 50.20 q/ha which was 20.92 per cent higher yield than local check (Sambha Mahsuri 41.53 q/ha.) In spite of increase in yield of improved technology the technological gap, extension gap and technology index existed which was 4.80 q/ha, 8.67 q/ha and 8.73 per cent, respectively. The improved technology of HYV Sambha Mahsuri-Sub 1 gave higher gross return of Rs. 79818/ha with a benefit cost ratio of 1.69 and additional net return of Rs.13780/ha as compared to local check variety. Hence, the existing high yielding rice variety Sambha Mahsuri can be replaced by HYV Sambha Mahsuri-Sub 1.

Keywords

Rice, High yielding variety extension gap, Technology gap, Technology index

Introduction

Rice is the staple food crop of India and occupies highest area among all the crops grown in the country (Shobha Rani *et al.*, 2010). Currently India produces rice that is sufficient not only to meet the domestic demands, but also was the largest exporter during 2012 (Mahender Kumar *et al.*, 2013), imparted to the selected farmers regarding different aspect of cultivation (Venkattakumar *et al.*, 2010). Rice is the only crop grown in the wet season from lowland ecosystem. Poor sunshine, inclement weather, disease pest incidence and the associated adversities affect crop growth. The scenario needs cutting edge technologies for increasing rice production in India. Although productivity of rice has increased from 2372 kg per hectare in 2011-2012 to 2390 kg/ha in 2016-2017, due to development of high yielding varieties with site specific

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-10: 277-283

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-10 pp. 277-283
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation of for Yield, Yield Component Traits and Quality Parameters of Rice (*Oryza sativa L.*)

S.P. Giri[1*], Saurabh Dixit[1], D.K.Verma[1], N.Parkash[2], V. Prasad[1], C.P. Singh[3], D.K. Dwivedi[1], A.K. Singh[1] and C.B. Singh[1]

[1]Crop Research Station, (ANDUAT), Masodha, Ayodhya
[2]Crop Research Station, (ANDUAT), Ghaghraghat, Bahraich
[3]Crop Research Station, (ANDUAT), Bara Bag,Gazipur

**Corresponding author*

Keywords

Basmati rice, Aromatic short grain, Kernel length, Kernel bre..th, L/B ratio, Cooking characteristics

A B S T R A C T

Genetic divergence was assessed among 21 rice variety including Basmati(3), Aromatic Short Grain (5), Medium Slender (3) and HYV(10).The experimental materials were evaluated during kharif- 2017 and 2018 at Crop Research Station, Masodha, Ayodhya. Physicochemical, cooking, pasting and textural properties of some rice varieties of Basmati, Aromatic short grain, Medium Slender grain and HYV were studied, of all the studied varieties was more than 3.0 and the L/B ratio of basmati varieties grains was significantly higher than non-basmati grains.Present study was carried out having high mean values for the economically important characters viz., number of total grains per panicle, number of productive tillers per plant and grain yield kg/ha etc.Hulling, mulling, head rice recovery, kernel length. Kernel bright, L/B ratio, ASV,AC, GC and aroma for the grains. Grain yield of Pusa Basmati 1 significantly higher (3672 kg/ha) followed by Pusa 1121(3488 kg/ha.), Ketki Joha (ASG)grain yield recorded was 3683 kg/ha followed by Shobini 3620,Swarna-Sub 1 (MS) grain yield was recorded in 6063 kg/ha. followed by Swarna 5750 and HYV grainyield of NDR 359(5475kg/ha.) followed by PA 6444 (5325 kg/ha.). The head rice recovery significantly higher 68.3% (MTU 1010) followed by Swarna-Sub 1 (67.20%), the mulling % higher Ketki Joha 72.20% followed by MTU 1153 71.60%. Basmati and aromatic cultivars had intermediate amylose content and MTU 1153 and Sahbhagi Dhan were grouped as low amylose containing cultivars. The GC was observed significantly lower of Gontra Bidhan 3, Swarna Chittimuthyalu, Tarori Basmati,Pusa 1121 and Shobini (GC 22) followed by Pusa Basmati 1 and BPT 5204 (GC 24) showing the lowest hardness among all the selected rice varieties.

Introduction

The slogan 'Rice is life' aptly describes the importance of rice in food and nutritional security. Rice (*Oryza sativa L.*) is the world's second most important cereal crop and staple food for more than 60% of the global population providing about 75% of the

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4546-4553

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 4546-4553
Journal homepage: http://www.ijcmas.com

Original Research Article

Genetic Divergence in Indigenous and Exotic Rice (*Oryza sativa* L.) under Saline-Alkali Condition

Preeti Kumari[1], Archana Devi[1], Ranjan Dwivedi[1], Saket Dwivedi[1], Ram Kishor[3] and D. K. Dwivedi[2]

[1]Department of Genetics and Plant Breeding, N. D. University of Agriculture and Technology, Kumarganj, Faizabad - 224 229 - U P, India
[2]Division of Crop Improvement, IISR, Lucknow, India
[3]Department of PMB&GE, N. D. University of Agriculture and Technology, Kumarganj, Faizabad - 224 229 - U P, India
**Corresponding author*

A B S T R A C T

Genetic divergence of 41 indigenous and exotic rice varieties of which five procured from India, one from Sri Lanka and 35 from IRRI, Philippines was investigated using Mahalanobis, D^2 statistic. Based on thirteen agromorphological characters, the forty one germplasm both indigenous and exotic were grouped into seven clusters based on the relative magnitudes of D^2 values following Tocher's method of cluster formation. Cluster II is the largest cluster consisting of 12 genotypes while Cluster I was the smallest with only a single genotype. The maximum intra cluster distance (D = 133.58) was found in cluster III consisting of 5 varieties. In the present study, maximum inter cluster distance was estimated between cluster III and VII ($\sqrt{D^2}$ = 913.36) which was followed by clusters II and VI ($\sqrt{D^2}$ = 755.83). Based on the rank totals, the characters which contributed maximum towards genetic divergence in the present studies were spikelets per panicle (30.24%) followed by days to 50% flowering (16.59%), flag leaf area (16.34%), plant height (14.39%), biological yield per plant (9.15%), spikelet fertility (5.12%), length/breadth ratio (3.41%), 1000 grain weight (3.17%), harvest index (1.46%) and panicle length (0.12%). Hence these traits could be focused for selection while improving quantitative traits. On the basis of their greater inter cluster distance, high value of cluster mean and performance of the individual germplasms for the character, the germplasm could be used in hybridization programme for improvement of different plant characters of the rice.

Keywords

Exotic Rice (*Oryza sativa* L.) under Saline-Alkali Condition

Introduction

Rice, being the staple food for more than 70 per cent of our national population and source of livelihood for 120 to 150 million rural households, is backbone of the Indian Agriculture. Salt affected areas have increased day by day because of excessive use of irrigation water with improper drainage coupled with the poor quality irrigation water. Development of varieties for underutilized soil is the only option to increase the production. Thus, adoption of high yielding rice varieties to various stress environment and underutilized land such as saline-alkalinity affected soil would be an important strategy to meet this challenge. The scarcity of productive agricultural land

VOL. XII, ISSUE XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

EFFECT OF *MORINGA OLEIFERA* LEAF EXTRACTS ON CARCASS CHARACTERISTICS AND MORTALITY OF BROILER CHICKENS

A. K. Verma[1], P. S. Pramanik[1], M. K. Verma[2], Jaswant Singh[2], Ruma Devi[3], A.K. Srivastav[2]andGaurav Panday[1]
[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya,
[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[3]Department of Livestock Product Technology, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
ajeetverma95@gmail.com

(MS Received: 25.07.2021; MS Revised: .29.08.2021; MS Accepted: 29.09.2021)
MS 2738 **(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT)**

Abstract
The present study was carried out to evaluate the influence of Moringa oleifera leaf extracts on carcass traits and mortality of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were; basal diet with no supplement (NC- negative control) and basal diet supplemented with antibiotics (PC-positive control), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE). Percent weight of various cut parts, eviscerated weight and drawn yield were evaluated after 35 days of experiment. The results showed significantly higher eviscerated weight and drawn yield percentage in Moringa extracts supplemented groups compared to PC group. PC and MOAQE group recorded significantly (P<0.05) higher drumstick % compared to NC, MOEE and MOALE group. Moringa extracts group recorded significantly (P<0.05) lower mortality than PCand NC group birds. From above results it was concluded that supplementation of Moringa extract of 1.5% Moringa oleifera leaf powder improved the carcass traits and reduced the mortality of birds.

Key words: *Broiler, Extract, Carcass, Mortality and Moringa (words in alphabetical order)*

Introduction

Major cost involved for poultry enterprise is in the form of feed. Various approaches such as feed supplements and additives are being used to obtain more net return and to minimize expenditure on feed (Agasheet *al.*, 2017). *Moringa oleifera* leaf (MOL) has fascinated great attention as a non-traditional feed component because of its unique qualities. Moringa oleiferagrows fast, drought-tolerant tree native belonging to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. Moringa is currently cultivatedglobally in the tropics and subtropics (Faheyet *al.*, 2001). Crude protein content in Moringa varies from 25% to more than 30% on a dry matter basis (Melesse et al., 2013), with a high proportion of essential amino acids (Lu *et al.*, 2016). Moringa leaves, flowers and Pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron and alpha-tocopherol (Dahot M.U., 1988). Moringa leaves are the preferred part of tree for use in animal diets as leaf meal due to high nutritional and medicinal properties (Abbas, 2013). The meat obtained from broiler chickens is an excellent source of protein, vitamins, mineralsand lower in fat content, so having a great demand among non-vegetarians(Naji *et al.*, 2013).Addition of*Moringa oleifera* leaf meal in broilers diet resulted significant increase in dressed weight, eviscerated weight and dressing percentage (Ayo-Ajasa *et al.* 2016). Dietary supplementation of Moringa leaves would be a potential strategy to improve the meat quality in broilers due to its antioxidant potential. It was further reported that phytosterols could lower malondialdehyde content and increase glutathione concentration in the breast muscle of broiler chickens (Naji *et al.*, 2013).

This study was carried out to evaluate the effect of different extracts (1 5%) of *Moringa oleifera* leaves powder as feed supplement in broiler diets on carcass characteristicsand mortality of broiler birds.

(Please correct red marks)

Materials and Methods

The present experiment was conducted after an approval from "Institutional animal ethical committee (IAEC)" was obtained vide reference number IAEC/CVSc/P-36/2019. A total of 250 one-day old Vencobb-430 strain chicks were randomly allocated into five dietary treatment groups with 5 replicates of 10 chicks in each. The chicks were kept on five dietary treatments which includes a basal diet without any additive in negative control (NC) or that supplemented with antibiotics (Positive control-PC), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE) in basal diet. Birds were fed *ad libitum* in different phases of experimental trial. The composition of formulated experimental diets as per BIS (2007) has been given in Table 1.

The chicks were kept on deep litter system under uniform standard management conditions with availability of clean, fresh and wholesome drinking water. Mortality was recorded during the entire research period. At the end of trial one bird per replicate (5 birds/treatment) were selected randomly for the carcass evaluation and sacrificed after 12 hours pre-slaughter fast though drinking of water was allowed. After complete bleeding carcass were dipped in hot water (58°C) for 1-2 minutes and feather were removed. Evisceration was done by making a slit from tip of breast bone up to the area around the cloaca. Thorough washing and cleaning were done after evisceration. After that the carcass were kept hanging on the special racks for 5-10 minutes. The visceral organs were removed by supporting the bird with one hand via the incised abdomen. Eviscerated carcasses were weighed and cut parts like thigh, drumstick, breast, wings, back, head, neck and shank were also weighed.The relative weight of dressed, drawn yield and different edible cuts were calculated as percentage of live weight.

The data were analysed under completely randomized (CRD) by employing one way analysis of variance (Snedecor and Cocran, 1994) and means of different dietary treatments were compared with Duncan multiple range test. The P value lower than 0.05 was thought-out significant.

(Please correct red marks)

Results and Discussion

Carcass characteristics:

The data pertaining to the carcass traits of broilers presented in Table 2. The results showed that the dressed weight and thigh weight of different groups was similar and showed no significant (P>0.05) effect of various Moringa extracts. The eviscerated weightof aqueous extract (72.24), ether extract (73.10) and alcoholic extract (73.09) supplemented group broilers were similar to NC (72.05) group, however significantly (P<0.05) higher than PC (70.39). The drawn yield of MOAQE, MOEE, MOALE and NC also significantly (P<0.05) higher than PC group. Leg and drumstick weight % of PC group was significantly (P<0.05) higher than MOEE and MOALE group. However, leg weight was

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]

[1]Department of Livestock Production Management

[2] Department of Livestock Farm Complex

[3]Department of Animal Genetics and Breeding

[4]Department of T.V.C.C.

College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) co of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly hig weight, lower feed intake and better FCR($P<0.05$). The body weight of chicks raised under sand and rice hull litter did n significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand li performance index of the earlier study period was significantly higher in paddy straw+ rice hulls followed by sand and ri respectively.

***Key words:** Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Srechari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth perf of kadaknath fowls

To study the feed conversion efficiency of kadaknath fow various bedding materials

Materials and Methods:

The present investigation was carried out to study the different litter materials on growth performance, feed gain Kadaknath fowl. The study was carried out at the poultry Teaching Livestock and Poultry farm of the College of V science and Animal Husbandry, N.D.U.A.T. Kumarganj, U.P., situated at a distance of 42 km away from Faizabad cit km away from Jagdishpur Industrial area at an altitude o above sea level and latitude of 26° 47' North and longitude East and it falls in Eastern plain Zone of Middle Gange region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of Nove February which comprised winter season of this region. Du period, the climatic parameters have been shown in table average minimum temperature recorded during study pe 12.54°C, while the average maximum temperature was There were a few showers of rain, ranging from 62 to 123 average was 92.5 cm during this period. The topography o almost even and most of the farm area remains dry round Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding an of Kadaknath Chicks in the brooder house. Brooding was pukka floor using deep litter system. Each group of Kadakna placed in separate pens which were visually isolated from e along with provision of adequate ventilation and artificial li brooder house.

Preparation of brooder house to receive Kadaknath chic

Brooder house was properly scrubbed and cleaned at leas before the trail began. After the house, equipments were cleaned. The house was allowed to dry out thoroughly. The h equipments were fumigated using 1% formalin. Three inches litter were made on the floor. Few days before the chick equipments were arranged in brooder house and the elect were started to adjust temperature and light. The temperatu the brooder house was slightly above 35°C. The corners of space were made rounded off with cardboard and metal chi to prevent chicks from piling up in the corner. All these pre

International Quarterly Journal of Science, Agriculture & Engineering

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[1], Vishuddha Nand[1] and A.K. Srivastav[1]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N:L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tramadol (T_T) and lignocaine + tramadol (T_{L+T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L+T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L+T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L+T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L+T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L+T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because hornless cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Goonewardene and Hand, 1991; Faulkner and Weary, 2000; Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with recognized methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978). The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Bengtsson *et al* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al* 1999). The Council of Europe recommends the use of anaesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L+T}). Medication was done 5-10 minutes before disbudding. Two doses of lignocaine per bud were injected for corneal nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (°F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 254-258

Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Gupta
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

RS Yadav
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

KD Singh
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

AK Srivastav
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

Vishuddha Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK Srivastav

Abstract
An experiment was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The experiment comprised of twelve treatments *viz.* T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), T_3 (100% N through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF +50% N through FYM), T_6 (50% RDF +50% N through Poultry Manure), T_7 (50% N through FYM+50% N through Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T_9 (75% RDF +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure), T_{11} (25% RDF +75% N through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in Randomized Block Design with three replications. the results revealed that the maximum plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of nodules $plant^{-1}$ were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) fallowed by 75% RDF +25% N through poultry manure and 75% RDF +25% N through FYM.

Keywords: FYM, Poultry manure, INM, growth, RDF, plant height, and leaf

Introduction
Berseem (*Trifoliumalexandrinum* L.) is one of the most important winter forage crop of India, due to high forage yield, palatability and nutritive value. It has become a very popular as *rabi* forage in irrigated areas or all most all over the country. Berseem belongs to one of the largest and most useful plant family leguminaceae and sub family faboideae. Berseem is known as king of fodder crops and it is popular among the world. It is one of the oldest cultivated crops, domesticated in Egypt and later introduced into many other parts of the world. Berseem was introduced in India in 1903 (Roy *et al.*, 2009) [5]. It is now widespread in the irrigated regions of west and south Asia. Most of the farmers conserved the berseem as hay to get cheap, palatable and nutritive forage during scarcity periods or early winter and summer. Berseem is a cheapest source of increasing milk production as well as improving soil fertility. Berseem can be sown in early autumn and can thus provide feed before and during the colder months but the optimum conditions are 18-25 °C. If the winter temperature falls to 6-8° C the crop growth is severely affected. This is nutritious, succulent and palatable fodder available for fairly long period during winter, spring and early summer (Chaterjee and Das, 1989) [2]. Grazing is possible though less common than cutting. The most important cultural practices that need to be carefully adjusted to achieve maximum benefit from the forage grass-legume mixtures. The ability to fix atmospheric nitrogen and convert it to a useable form for plant growth is the main trait to these legumes (Allen and Allen, 1981) [1].
Poultry manure is an excellent soil amendment that provides nutrients for growing crops and also improves soil quality when applied widely, because it has high organic matter content combined with available nutrients for plant growth (Ryssen *et al.*, 1993) [7]. The application of FYM with chemical fertilizers and composted with rock phosphate to improve crops yield is very well established (Shafi *et al.*, 2012) [8]. Fertilizers play an important role in enhancing forage productivity. Chemical fertilizers are soluble and immediately available to the plants; therefore, the effect is usually direct and fast, the price is lower and they are quite high in

GENETIC STUDIES ON REPRODUCTIVE TRAITS OF HARIANA COWS

***Ashish Kumar Srivastava, Jaswant Singh and V.K. Singh**
*Assistant Professor, Department of LFC
College of Veterinary Sciences and Animal Husbandry
N.D.U.A.T., Kumarganj- Faizabad (U.P.)

Abstract

The performance records of 211 Hariana cows, progeny of 27 sires, born during the year 1966 to 1985 having at least records up to second calving were utilized in this study. These cows were maintained at D.D.D. farm, Mathura and livestock farm, Madhurikund (Mathura). The average post partum oestrus interval was estimated to be 185.43± 11.18, the heritability estimate of post partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non significant and the variation in post partum oestrus accounted due to sires was very small (8.7%) in total variation. The least squares means and their standard errors of number of service per conception were estimated to be 2.19±0.26. The heritability estimate of the number of service per conception was estimated to be 0.294±0.210. The contribution of sires was 21.8% in the total variation of the trait.

Introduction

The cow is an efficient machine for converting farm crops into useful human food like milk and milk products, which are the main source of animal protein in the diet of a large vegetarian population of the country. Hariana breed of zebu cattle has been well established dual-purpose breed known for its milk yield as well as for draught ability. The breed has reduced significantly and is continuing to decline at an alarming rate. Apart from the declining population, Hariana cattle have also deteriorated in their productivity (Joshi et al., 1995).

Materials and Methods

The present study was undertaken on Hariana cows. All the animals taken into consideration were farm bred. The data used in this investigation were collected from the pedigree sheets, milking register and breeding record of Hariana cows maintained at DDD Farm, Mathura. The performance record of 211 cows, having at least record up to second calving were collected for genetic studies. The statistical analysis of the data was carried out by using the LSMLMW (Least Squares and Maximum Likelihood Method)- Harvey (1990) PC-2 version computer programme and Henderson (1953) model were used.

Results and Discussion

The least squares mean of the post-partum oestrus interval along with their standard errors have been presented in table 1. The average post-partum interval was estimated to be 185.43±11.18 days. The frequency of animal in various PPO groups (class interval of 40 days) is about 23.69% animals had post-partum oestrus interval below 90 days. The maximum frequency of animals was in 90 to 130 days group (26.54%). Present observation is comparatively higher than the average of post-partum interval reported by Luktuke and Subramanium (1961), Singh et al., (1964), Arora et al., (1971), Acharya et al. (1971) and Khanna (1998) for Hariana cows. Whereas, Kohli and Suri, 1957, Kohli and Suri, 1960 and Tomar and Arneja, 1972 have reported comparatively higher post-partum oestrus in Hariana cattle.

Least squares analysis of variance was performed to study the effect of farm, period and session of calving are present in table 2. The perusal of the table revealed that the effect of farm was found to be non-significant on post-partum oestrus interval in Hariana cows, although the contribution of farm was highest (83.5%) in total variation. However, Ashraf et al., (2000) observed highly significant farm effect on post-partum oestrus interval. The effect of period and season of calving were found non-significant. However, Mahmoud et al., (1991) observed a significant effect of month of calving.

Heritability estimate of post-partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non-significant and the variation in PPO accounted for due to sires was very small (8.7%) in total variation. The findings were indicative of zero heritability for this trait in these animals. Similar observations were reported by Prasad (1958) for Tharparkar cattle and Singh et al., (1964) for Hariana cattle.

Conclusion

Any selection programme based on post-partum oestrus interval will not prove beneficial in these cattle because the genetic variability for this character in these animals does not seem to exist. In view of the above observations, improvement in managemental practices may lead improvement in this trait.

References

Acaraya, R.M.; Dhillon, J.S. and Agrawal, S.C. (1971). A note on the factors affecting post-partum oestrus interval in Hariana cattle. Indian J. Anim. Sci. 41 (7) : 524-525.

Arora, K.L.; Tomar, S.S. and Singal, S.P. (1971) Factor effectin the reproductive efficiency of Hariana cattle the duration of post-partum breeding interval. The Indian Veterinary Journal **48**: 1015-1019.

Joshi, B.K.; Tantia, M.S.; Kumar, P.; Gupta, Neelam; Vij, P.K.; Nivsarkar, A.E. and Sahai, R. (1995). Hariana cattle a monograph on breed characterstics. NBAGR Research Bulletin No (3), NBAGR P.B. 129, Karnal-132001, India.

Khanna, Neetu (1998). Studies on certain aspects of reproductive performance in Hariana and crossbred cattle. M.V.Sc. thesis in Vet. Obstetrics and Gynaecology submitted to C.S. Azad Univ. of Agri. And Tech. Kanpur.

Kohli, M.L. and Suri, K.R.; (1960). Longevity and Reproductivity in Hariana cattle. Indian J. of Veterinary Sci. and A.H. 27 (1): 105-110.

Luktuke, S.N. and Subramanium, P.; (1961). Studies on certain aspects of oestrus phenomenon in Hariana cattle. J.Reprod. Fert. 2: 199-200.

Singh, O.N.; Prasad, J.N. and Prasad I.B. (1964). Conception rate of Hariana and Bachur cows under artificial breeding condition in the farm. Indian Vet. J. 41: 513-520.

Tomar, N.S.; Srivastava, K.N. and Singh B.P. (1976). Heritability estimates of fertility of Hariana heifers and their age at first calving. Indian J. Ani. Health. June: 63-66.

ASSOCIATIONS AMONG BODY CONDITION SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

Vikas Singh[1], V. K. Singh[2], P. S. Parmanik[1], A.K.Verma[1] and A.K.Srivastav[3]
[1]Department of Livestock Production Management
[2]Department of Animal nutrition
[3]Department of L.F.C
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract
To assess the associations among body condition score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of dairy cows, 50 cows (HF cross) at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<3.0, thin), group II (3.0<BCS>3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly (P<0.05) higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score (SCS) was correlated negatively with BCSC and positively with BCSL.

Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

Milk quality is as significant as the milk quantity in dairy animals. High yielding dairy cows had higher incidence of mastitis that can be assessed by somatic cell count (SCC) of milk (Kadarmideen and Bryce, 2001). Optimal body condition of dairy cow is important for obtaining elite herd and quality milk. Low or higher body reserves may pose a risk of lower milk yield and higher SCC in milk respectively (Berry et al., 2007). High yielding dairy cows exhibit negative energy balance after calving which may influence both immune and metabolic system of the individual that predispose the animals to mastitis. Body condition score had a favourable correlation with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. Hence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), Production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). The SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as SCS=$\log_{10}$SCC (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly (P<0.05) among the three groups of cows. The BCS during calving to 15 days were significantly (P<0.05) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al.*, 2000, Friggens *et al.*,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3≤BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
0	2.83^{c}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
30	2.63^{b}±0.12	2.82^{bB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
60	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
90	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
120	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: (P<0.05)
Values with different superscripts capital letter in a column differ significantly: (P<0.05)

BREEDING VALUE ESTIMATION FOR LIFETIME IN SAHIWAL CATTLE AND CORRELATION STUDIES AMONG DIFFERENT METHODS

Jaswant Singh* , C.V. Singh, M.K. Verma and A.K. Srivastava
College of Veterinary Sciences and Animal Husbandry
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229 (UP)
*Part of the Ph.D.thesis submitted by the first author to the G.B.P.U.A. &T., Pantnagar

Abstract

The genetic worth of a sire can be measured directly but it has to be estimated either on the basis of phenotypic performance or observed value of a trait in the sire itself, or information from relatives in sex-limited traits such as milk yield.

The present investigation was undertaken on 1367 first lactation records of Sahiwal cattle maintained at GLF, Chak Ganjaria, Lucknow (U.P.) over a period of 71 years (1944-2014). The study was conducted on breeding value estimation of sires, relationship between Estimated Breeding Values (EBV's) for first lactation and life time traits using daughter's average, least-squares and best linear unbiased prediction methods of sire evaluation and effectiveness of these methods. The rank correlations among the breeding value of sires estimated from first lactation milk yield and life time milk were medium to high and highly significant (P<0.01). Therefore, the daughters of the sires selected on the basis of high first lactation milk yield would tend to produce higher life time milk yield. The product moment correlations among the estimated breeding value of the sires for first lactation traits by all the three methods ranged from medium to very high and highly significant (P<0.01) in all the three methods of sire evaluation.

Introduction

Cattle rearing has been an important source of livelihood in India and is closely associated with agricultural economy. The agriculture and allied sectors contribute nearly 14 per cent of the Gross Domestic Production. The agriculture and livestock are the main source of employment in rural areas and about 52 per cent of the population is engaged in agriculture and rearing of livestock in our country.

The effectiveness of sire evaluation is the backbone of any breed improvement programme. This investigation was planned to evaluate Sahiwal sires as its performance is remarkable in hot climate and has been recognized worldwide as one of the best milch breed (Ilatsia et al., 2011). Various sire evaluation methods viz. daughter's average, least-squares analysis and best linear unbiased prediction (B.L.U.P.) were used to evaluate the sires and their effectiveness were compared for Sahiwal cattle. The information on the production of first lactation is mainly required for getting genetic improvement through selection, since it serves as an index of life time production in dairy cows. Therefore, it is very much essential for the sire evaluation to correlate the first lactation milk yield with life time milk production.

Materials and Methods

The data for the present investigation were collected over a period of 71 years (1944-2014) from pedigree sheet of 1367 Sahiwal cows born to 112 sires maintained at Government Livestock Farm, Chakganjaria, Lucknow (U.P.). Only the sires having the records on at least three or more daughters were included in the present study. The total duration of the present study was divided into 8 periods.

Out of 8 periods 7 are of 9 years each and 8th period of 8 years only. Each year was divided into three seasons namely winter (November-February), Summer (March- June) and Rainy (July- October). In order to classify the data for different periods and seasons year and season of calving was considered for all the traits.

Statistical Analysis

Rank correlation

After estimation of breeding value of sires, the sires were given rank as per their genetic merit. The Spearman's rank correlation between breeding values of sires derived by various methods was used to judge the effectiveness of different methods. The rank correlation was estimated as per methods developed by Steel and Torrie (1960).

$$r_s = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$

Where,

r = Rank correlation coefficient

n = Number of sires under evaluation

d_i = Difference of rank between paired items under two methods

The significance of rank correlation was tested by t-test as given below

$$t = r\frac{\sum(n-2)}{(1-r^2)}$$

It was compared with t-table value with (n-2) degree of freedom.

Simple product moment correlations

The simple correlations (r) between the estimated breeding values of bulls by different sire evaluation methods were also calculated by the following formula:

$$r_{(XY)} = \frac{Cov(XY)}{\sqrt{[Var\ (x)\ \ Var\ (Y)]}}$$

Where,

$$Cov\ (XY) = \sum XY - \frac{(\sum X)\ (\sum Y)}{n}$$

$$Var\ (X) = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$Cov\ (Y) = \sum Y^2 - \frac{(\sum Y)^2}{n}$$

Where,

X, Y= The breeding value of sires estimated by two different methods

n= Number of pairs of breeding value

Rank correlation

The rank correlations of most efficient method (LSM) of sire evaluation for LTMY was statistically highly significant (P<0.01) with their values 1.00 ($\overline{D}$ and LSM), 0.71 ($\overline{D}$ and BLUP) and 0.71 (LSM and BLUP). For LTLL, the rank correlation between the different methods were 1.00 ($\overline{D}$ and LSM), 0.79 ($\overline{D}$ and BLUP) and 0.79 (LSM and BLUP). The rank correlation of estimated breeding values of LTMY between daughter's average and least squares method was very high (100%) (Table-1).

It revealed that ranking of sires for the estimated breeding value by daughter's average and least-squares method was similar while ranking of sires from BLUP was different. Similarly, for the LTLL, the rank correlation of estimated breeding values between ($\overline{D}$) and LSM was very high (100%). It revealed that ranking of sires for the estimated breeding value by $\overline{D}$ and LSM was similar while ranking of sires by BLUP was different.

Product moment correlation

The product moment correlations of most efficient method (LSM) of sire evaluation for LTMY with other two methods of sire evaluation (

EFFECT OF DIFFERENT LITTER MATERIALS ON BEHAVIOR OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]
[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract
The present study was conducted to investigate the effect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were seemed to be significantly differed in morning, noon and evening hour interval.

Keywords: Kadaknath, feed, behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over that of exotic chickens (Dessie and Ogle, 2001). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007). Various types of litter materials like sand (shields *et al.*, 2005), saw dust (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of Kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26^0 47' North and longitude of 82^0 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54^{0}C, while the average maximum temperature was 24.86^{0}C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35^{0}C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivnathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

International Journal of Plant & Soil Science

34(1): 63-70, 2022; Article no.IJPSS.81077
ISSN: 2320-7035

Effect of Land Configuration and Moisture Regimes on Productivity of Hybrid Maize (*Zea mays* L.) in Summer Season

Vishuddha Nand [a*], Vinay Kumar Patel [b] and Ashish Kumar Srivastav [a]

[a] Department of LFC, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.
[b] Department of Agronomy, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i130825

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/81077

Original Research Article

Received 17 November 2021
Accepted 20 January 2022
Published 25 January 2022

ABSTRACT

An experiment was conducted on "Effect of land configuration and moisture regimes on productivity of hybrid maize (*Zea mays* L.) in summer season." during 2018-19 at Agronomy Research Farm, ANDUA and T, Kumarganj, Ayodhya (U.P.). The experiment accomplished of 12 treatment combinations and laid out in split plot design, replicated three times. The Experiment consisted of three land configuration *viz.* flat bed planting (P_1), ridge planting (P_2) and paired row planting on raised bed (P_3) were kept in main plots and four moisture regimes *viz.*0.5 IW/CPE ratio, 0.7 IW/CPE ratios, 0.9 IW/CPE ratios and 1.1 IW/CPE ratios were allotted in sub plots. The experimental results revealed that growth parameters, such as plant height, leaf area index, dry matter accumulation, days to 50 percent ear emergence and days to50 percent maturity and yield were obtained maximum with the paired row planting methods followed by ridge planting and flat bed planting and yield attributes such as number of cobs plant^{-1} , number grains row^{-1}, number of grains cob^{-1}, cob length (cm), cob girth (cm), grains weight cob^{-1}(g), cob weight (g), shelling percentage (%), grain yield (q ha^{-1}), stover yield (q ha^{-1}), and biological yield (q ha^{-1}) were also increased similarity in same treatment. In case of moisture regimes, the same trends were observed maximum when applied irrigation at 1.1 IW/CPE ratios as compared to other moisture regimes.

**Corresponding author: E-mail: vishuddhanand84nd@gmail.com;*

Indian Journal of Agricultural Sciences 92 (2): 236–9, February 2022/Article

Determinants of behavioural indicators of potato (*Solanum tuberosum*) growers in Kannauj district of Uttar Pradesh

ASHWANI KUMAR VERMA[1], R K DOHAREY[2], S K DUBEY[3]*, O P SINGH[4] and S N SINGH[2]

ICAR-Agricultural Technology Application Research Institute, Kanpur, Uttar Pradesh 208 002, India

Received: 07 July 2020; Accepted: 31 August 2021

ABSTRACT

The present study was carried out to find out the factors that may affect the behavioural dimensions of potato farmers, viz. their knowledge and adoption level as well as their knowledge-adoption gap about scientific potato cultivation practices in Kannauj district of Uttar Pradesh during 2016–17. Multiple regression and stepwise regression analysis was done with selected independent variables to see the effect of independent variables on the selected indicators. The analysed data showed that at knowledge level out of 18 variables taken for analysis of regression, four variables, viz. housing pattern, occupation, material possession and formal extension contact were highly significant (P<0.01); five variables, viz. education, housing pattern, informal extension contact, scientific orientation and risk orientation were highly significant (P<0.01) for their adoption level; and at knowledge-adoption gap one variable i.e. education was highly significant (P<0.01). The R^2 value and F value of knowledge, adoption and knowledge adoption level were 0.59, 0.29, 0.33 and 8.63, 2.52 and 2.95 (P<0.01), respectively. The R^2 value of stepwise regression in knowledge, adoption and knowledge-adoption gap level was 0.54, 0.24 and 0.24.

Keywords: Adoption, Knowledge, Multiple regression, Potato

Potato (*Solanum tuberosum* L.) belongs to family Solanaceae, is well known as the king of vegetables and has emerged as the most important food crop of India. Despite higher retail price of potato, the sowing of tuber is set to shrink in Northern states as farmers prefer alternate crops including onion, garlic, sugarcane and other perishables during *rabi*. Introduction of potato crop is not only important for ensuring socio-economic upliftment of the local farmers but for warranting financial sustainability of crop husbandry also (Rana *et al.* 2017). In last few years, the gap between wholesale and retail price of potato has widened by two-three times. It has disappointed potato growers and many are shifting to other crops. Mostly big farmers who store their produce have incurred losses in potato business and many such farmers are shifting from cultivation of tuber. In the last three years, glut in potato production has caused unrest among farmers in North. The annual output has grown to 53 million tonnes (MT) in 2018–19 compared to 51 million tonnes in 2017–18 (Krar 2019). The increase in area of potato cultivation has squeezed margins for growers as well as traders in the region.

[1]C.S.A. University, Kanpur, Uttar Pradesh; [2]N D University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh; [3]ICAR-ATARI, Zone III, Kanpur; [4]ICAR-Indian Agricultural Research Institute, New Delhi. *Corresponding author email: skumar710@gmail.com

Uttar Pradesh is a major potato growing state in India followed by West Bengal and Bihar with the production of 10455.30, 7482.30 and 1720.20 thousand tonnes, respectively. It produced almost 13.1 MT of potato, thus contributing nearly 28.6% of total potato production in the country (Directorate of Economics and Statistics 2016). Kannauj district is the highest producer of potato followed by Farrukhabad and Agra with production of 9.43, 8.33 and 6.47 lakh metric tonnes with area being 34.6, 29.8 and 18.20 thousand hectares, respectively (Anonymous 2001–02). Therefore, considering the significance of potato in Kannauj district, the study was carried out to analyse the profile of potato farmers of the district and to identify the determinants which may affect their behavioural dimensions in terms of their level of knowledge, adoption and knowledge-adoption gap.

MATERIALS AND METHODS

The present study was carried out in Kannauj district of Uttar Pradesh during 2016–17, which was selected purposively due to its high grown area under potato crop. It is considered to be the most climatically suitable area for potato cultivation. Jalalabad block of Kannauj district with maximum area under potato cultivation was further selected purposively. Five villages, viz. Paraspur, Gadnapur, Mirpur, Purva, and Bisundhua were selected randomly and from each village, 25 farmers actively involved in cultivating potato were further selected randomly.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(6): 502-505
Received: 15-09-2020
Accepted: 21-10-2020

Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Prakash Singh
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Singh
SMS/Scientist, Department of Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi, Peppeganj, Gorakhpur, Uttar Pradesh, India

Rishi Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhay Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Pandey
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Factors influencing adoption level of farmers regarding organic farming in eastern UP

Arvind Pratap Singh, Prakash Singh, RK Doharey, RK Singh, Rishi Kumar Singh, Abhay Kumar Singh and Vikash Pandey

Abstract
This study was undertaken in three districts selected randomly from each Zone namely (1) North Eastern Plains Zone (2) Eastern Plains Zone (3) Vindhyan Zone in Eastern Uttar Pradesh. From each selected district, two blocks were selected randomly. Thereafter two villages from each block was selected randomly, thus make a total 12 villages. The majority of respondents were of middle aged and literate including formal and informal education. Highest number of the respondents (55.83%) was observed in the medium category (33 to 44) of materials possession. Majority of farmers (60.41%) had medium level of overall extent of awareness about organic farming practices. The variables like age, family size, material possession and economic motivation, were found positively correlated but not significant with adoption level regarding organic farming practices. The variables like education, caste, family type, housing pattern, land holding, occupation, income, social participation, extension contact, value orientation, risk orientation and attitude were found negatively correlated but not significant with adoption level regarding organic farming practices.

Keywords: block, proportionate, age, education, overall materials possession, organic farming practices, adoption, correlations etc

Introduction
The organic movement in India has its origin in the work of Howard who formulated and conceptualized most of the views which were later accepted by those people who became active in this movement. Organic farming is a production system which avoids, or largely excludes, the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives.

The Indian government has initiated various promotional activities, such as setting up a National Institute of Organic Farming in Ghaziabad, Uttar Pradesh, in 2003, appointment of accreditation and certifying agencies for organic farm products, developing norms for certifying organic products and providing financial support to implement promotional activities for organic farming. The task force constituted by the Government of India has also recommended the initiation of post-graduate level courses in organic farming. One of steering committee constituted by Central Government under the chairmanship of Mr. M.S. Swaminathan, Chairman, farmer's commission, has suggested taking up organic farming as a challenging national task and to take up this as a trust area of the 10th Five Year Plan. The Ministry of Commerce launched the National Organic Program in April, 2002 and processed food products export.

"Organic farming is a production system that avoids or largely excludes the use of synthetically compounded fertilizer, pesticides, growth regulators and livestock feed additives. Organic farming systems rely to the maximum extent on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilt, to support plant nutrients and control insects, weeds and other pests". (Kanel, 2005) [2].

Methodology
The present study was conducted in six blocks of three districts namely Barabanki Basti, and Prayagraj of Uttar Pradesh. Each district selected two block and find out the different independent variables and their level of adoption of organic farming practices in organic farming. Those blocks namely Masauli, bani kodar, Haraiya, Vikram jot, Phulpur and Dhanupur was selected randomly having production area of agriculture.

Hence, the present study has been designed to explore the level of adoption of organic farming practices in Barabanki, Basti, and Prayagraj districts of Uttar Pradesh with specific objective.

Journal of Natural Resource and Development 16 (1) 150-160 2021 | NAAS RATING : 3.77 | ISSN-0974-5033

APPLICATION AND USE OF MOBILE PHONE FOR INDIAN AGRICULTURE SECTOR: A REVIEW PAPER

[1]Rishi Kumar Singh, [1]R. K. Doharey, [1]N. R. Meena, [1]Alok Kumar Singh,
[2]Adesh Kumar Verma, [3]Neeraj Kumar and [1]Vikas Pandey
[1]A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, (U.P.), India
[2] Kulbhaskar Ashram P.G. College, Praygraj, (U.P.), India
[3] Division of Les & IT ICAR- IVRI, Izatnagar, Bareilly, (U.P.), India

Received : 15.12.2020 Accepted : 21.01.2021

ABSTRACT

Agriculture is the most important sector of the Indian economy and is more or less a compulsion for the livelihood of millions of farmers. Many initiatives have been taken in this regard to utilize mobile phones by private sector (Indian Farmers Fertilizer Cooperative Limited, Nokia, Airtel, Tata Consultancy Services, etc.), public sector (Ministry of Agriculture and Farmers Welfare, Agricultural Universities, Research Institutions like Indian Council of Agricultural Research, State Governments). The Indian government and other development agencies promote farmers and their income generating projects as a way of encouraging growth through increased agricultural production. The impact of new technology to economic growth can only be realized when the use of these new technologies is widely diffused. Introduction of mobile phones and services in agriculture can be advantageous to farmers, traders and producers for improving their decision making.

Keywords : Agriculture, mobile phone, farmers, e-Mandi, Mandi Trades

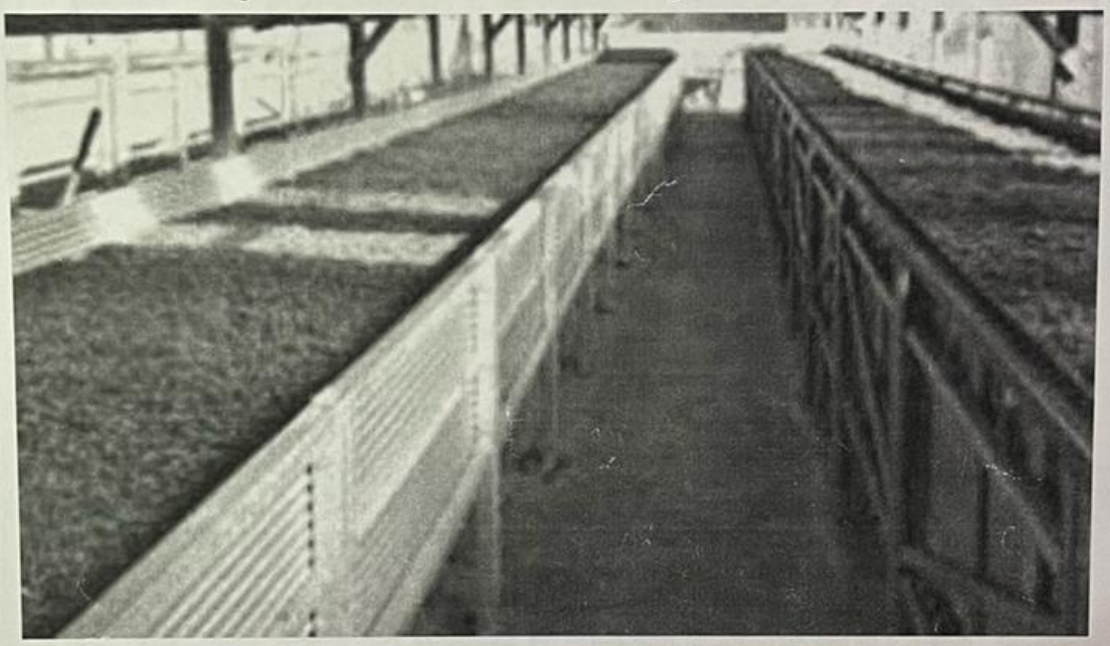
INTRODUCTION

Indian economy is the most important aspect of the agricultural sector. Research, extension and farmer's efforts have all contributed significantly in increasing food production from 50 million tonnes in 1950-51 to a landmark achievement of an estimated 259.32 million tonnes in 2011-12 (MOA, GOI, 2013). Estimates indicated that 60 per cent of farmers do not access any source of information for advanced agricultural technologies resulting in a huge adoption gap (NSSO, 2005). Government, private, and general public agencies are often interested in the decisions made by the Indian farmers as they have large influences beyond the farm. Agriculture clearly remains one of the most important portfolios in

वर्मीकम्पोस्ट या केंचुआ खाद क्या है केंचुआ खाद तैयार करने की विधि

आर0के0 दोहरे एवं आर0के0यादव

नरेन्द्र देव कृषि एवं प्रौद्योगिक विश्वविद्यालय, कुमारगंज, फैजाबाद (उ०प्र०)



परिचयः– केंचुआ खाद या वर्मीकम्पोस्ट पोषण पदार्थों से भरपूर एक जैव उर्वरक है। यह केंचुआ आदि कीडों के द्वारा वनस्पतियों एवं भोजन के कचरे आदि को मिलाकर बनाई जाती है। केंचुओं के आंतों के अन्दर जो पोषक तत्व होते हैं उसके द्वारा ग्रहण कर लिये जाते हैं और बाकी का जो मल निकलता है वह उत्तम गुणवत्ता वाला जैविक खाद होता है। वर्मी कम्पोस्ट में बदबू नहीं होती है और मक्खी एवं मच्छर नहीं बढ़ते हैं तथा वातावरण भी प्रदूषित नहीं होता है। अवघटनशील व्यर्थ कार्बनिक पदार्थों जैसे–भूसा, पुआल, घास–पत्ते, गोबर आदि कचरे को मिलाकर केचुओं को आहार के रूप में भोजन मिलता है उसे वर्मीकम्पोस्ट कहते हैं।

एक अनुमान के अनुसार केंचुआ 1000 टन कार्बनिक पदार्थ को 300 टन जैविक खाद में बदल देते हैं। गंदगी नियंत्रण में केंचुए की अहम भूमिका है। यह रबर, प्लास्टिक व धातु को छोडकर लगभग सभी कुछ खा जाते हैं। वर्मीकम्पोस्ट बनाने के लिए इस विधि में क्षेत्र का आकार अवश्यकतानुसार रखा जाता है। मध्यम वर्ग के किसानों के लिए 100 वर्ग मीटर क्षेत्र पर्याप्त है। अच्छी गुणवत्ता के केंचुआ खाद बनाने के लिए सीमेन्ट तथा ईंटों से पक्की क्यारियां बनाई जाती हैं। प्रत्येक क्यारी की लम्बाई 3 मीटर, चौडाई 1 मीटर एवं ऊँचाई 35–50 सेमी0 रखते हैं।

वर्मीकम्पोस्ट या केंचुआ खाद तैयार करने की विधि :–

1. **केंचुओं का चुनाव**– वर्मीकम्पोस्ट में केंचुओं की उन प्रजातियों का चुनाव किया जाता है जिनमें प्रजनन वृद्धि दर तीव्र हो, प्राकृतिक तापमान में उतार–चढाव सहने की क्षमता हो। उदाहरण– आइसीनियाँ फीटिडा, यूडिलस, यूजेनी तथा पेरियोनिकस एकस्केवेटस। कानपुर या उन्नाव जनपद के लिए आस–पास के सभी क्षेत्रों में आइसीनियाँ फीटिडा वर्मी कम्पोस्ट के लिए उपयोगी है।
2. **वर्मीकम्पोस्टिंग योग्य पदार्थ**– इस प्रक्रिया के लिए सभी प्रकार के जैव कार्बनिक पदार्थ जैसे– गाय, भैंस, भेड, सुअर, तथा मुर्गियों आदि का मल बायोगैस स्लरी, शहरी कूडा, प्रौद्योगिक खाद्यान्न का बचा हुआ पदार्थ

Biological Forum – An International Journal 13(2): 01-07(2021)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Review on Frontline Demonstration of KVK and its Effect on Yield, Economics, Income and Management Practices of Different Crops in India

Shesh Narain Singh[1], Manoj Kumar[2], *M. P. Gautam[3] and R. K. Doharey[4]

[1]SMS, Krishi Vigyan Kendra, Sohna, Siddharthnagar,
ANDUAT, Narendra Nagar, Ayodhya, India- 224229, (U.P.) India.
[2]Gest Faculty, Department of Extension Education,
Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India.
[3]Department of Entomology,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.) 250110, India.
[4]Professor, Department of Extension Education,
College of Agriculture, ANDUAT, Narendra Nagar, Ayodhya, (U.P.) 224229, India.

(Corresponding author: M. P. Gautam)*
(Received 12 March 2021, Accepted 25 May, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Field demonstration is the elderly concept of Front-Line Demonstration. FL developed by the Indian Council of Agriculture Research with the beginning of the Technology operation on Oilseed Crops during mid-eighties. Field demonstrations carry out close regulation of scientists of National Agriculture Research System recognized as frontline demonstrations because technologies are demonstrated in front of farmer by the scientists before being fed into the major extension method of the State Department of Agriculture. Adoption level of the beneficiaries were medium to high even as non-beneficiaries were found small level of adoption are enhanced production practice of mustard crop, proper training and extension strategies to be followed maximum adoption of mustard crop in the research area.

Keyword: Frontline Demonstration, KVK, Yield, economics, growth, management practices and India.

INTRODUCTION

The Krishi Vigyan Kendras were assigned different actions pertaining to evaluation, modification and expression of different novel technologies. This includes conduction of association of Frontline demonstration, estimation, training programmes and sophistication of different agriculture and related technologies during OFT. Extension activities and movement of Krishi Vigyan Kendras do significant movement for the farmers and useful in hole crop period. Krishi Vigyan Kendras are the base of all organizations who work for purpose of technology through refinement, evaluation and demonstration of confirmed technology under diverse "micro farming" situation in a region (Das, 2007). In the year 1991-92 Indian Government established a "Technology Mission on Pulses" to improve the pulse production and productivity through frontline demonstration. The mandate of the Krishi Vigyan Kendra (KVKs) are application of technology through refinement, demonstration and assessment of verified technologies under different "micro farming" situations in a region (Das, 2007).

Frontline demonstrations is show recently released crop protection and production technology and its running practice on the farmers field under diverse farming situation and agro-climatic regions. While demonstrating the technologies on farmer's field, the scientist are compulsory to study situation, factors and elements involving in higher crop production, Limitation of production and thereby create production data and feedback information. Frontline demonstrations were conduct in two adopted villages at pasture of 20 farmers within area of 0.4 hectare each. Moong crop was grown according to the package and practices of moong crop according field demonstration (Anonymous, 2017).

A. Additional activities to be conducted by KVKs

1. Field day
2. Kisan Mela
3. Kisan Gosthi
4. TV/Radio talk
5. Film Show
6. Farmers visit to KVKs
7. Diagnostic and Exposure Visits
8. Trainee and Ex-trainee meet
9. Commemoration of important day
10. Animal Health Camp
11. Trade fair
12. Kisan Mobile Sandesh

The Pharma Innovation Journal 2022; 11(4): 1021-1025

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(4): 1021-1025
© 2022 TPI
www.thepharmajournal.com
Received: 03-01-2022
Accepted: 09-02-2022

KM Komal
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Adesh Kumar
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Muzaffar Ali Khan
Department of Agriculture, IIAST Integral University, Lucknow, Uttar Pradesh, India

Akrati Dev
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashish Kumar
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Shambhoo Prasad
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Niyaj Ahamad
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
KM Komal
Department of Plant Molecular Biology and Genetic Engineering, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of plant growth-promoting rhizobacterium (PGPR) on chlorophyll content of chickpea plant (*Cicer arietinum* L.)

KM Komal, Adesh Kumar, Muzaffar Ali Khan, Akrati Dev, Ashish Kumar, Shambhoo Prasad and Niyaj Ahamad

Abstract
Green plants produce a varied arrangement of primary and secondary metabolites. Chlorophylls are the principal metabolites that give leaves and fruits their colour. Chlorophylls spectrum characteristics are critical for capturing light energy and transducing absorbed light energy for photosynthesis. Like other plants, Chlorophyll content affects leaf colour and photosynthetic activity. The amount of Chlorophyll in a plant's leaves impacts its photosynthetic capability per unit area of its leaf and stress and nutritional inadequacies. The Arnon method was used to analyze the concentrations of Chlorophyll a and b. This work investigates the PGPR element regulating Chlorophyll content and supply defence in chickpea plants. After that, the chickpea plant was examined for a Chlorophyll estimation test for 30, 60, and 90 days. We noticed treated crops having CHL content, which was found to have different values after thirty, sixty, and ninety days.

Keywords: PGPR, *Cicer arietinum* L., chickpea, *Fusarium oxysporum*, *Bacillus*, *Pseudomonas*

Introduction
The commercial worth of plant organs is determined by colour, while the freshness of most vegetables is determined by texture. Pigments are responsible for the perception of colour. Pigments are abundant in fruits and vegetables, which appeal to customers. Plant pigments are classified into different groups based on their chemical makeup. Chlorophyll, carotenoids, anthocyanins, and flavonoids can be identified (Manolopoulou *et al*., 2016) [18].
The amount of Chlorophyll in leaves is a crucial feature studied to measure Chloroplast concentration, photosynthetic activity, and plant metabolism. Chlorophyll is an antioxidant found in green leaf plants' Chloroplasts, primarily in the roots, branches, florae, andleaves (Mirza *et al*., 2013; Srichaikul *et al*., 2011) [19, 25]. Instead, CHL product primarily depends on sunlight piercing and is the plant's primary energy source (Srichaikul *et al*., 2011)[25]. Extract the pigments; it's commonly done in the lab with a pestle and mortar and acarbon-based solvent like acetone (Arnon 1949; Porra *et al*., 1989) [1]. Plant photosystems require the pigments Chlorophyll A and Chlorophyll B. (Richardson *et al*., 2002) [21]. Furthermore, CHL a is the most abundant colourant for photosynthesis in plants, supporting producing energy (Srichaikul *et al*., 2011) [25]. Ontheotherhand, CHLaconc in plantsis 2-3 times larger than subordinate CHL b conc (Srichaikul *et al*., 2011) [25]. Chlorophyll absorbs light of various wavelengths, especially in the visible spectrum's red (650–700 nm) and Amethyst colour (400–500 nm) areas. The green colour comes from the fact that green light (550 nm) is reflected rather than absorbed. Chlorophyll A is an Aquamarine colour pigment, whereas CHL B is a Chartreuse colour. The volume of solar energy consumed by a leaf is primarily determined by the conc of photosynthetic pigments on its foliar surface. As a result of low CHL levels, photosynthetic capacity and primary production may be limited (Da Matta *et al*., 2008; Kumari *et al*., 2018) [14, 16].
Compared to Chlorophyll, non-Chlorophyll accessory pigments such as carotenoids are found in a and b. It absorbs light and sends it to a different photosystem. By absorbing and dispersing excess light energy, carotenoids also serve as antioxidants. The spectra of CHL and non-CHL pigments differ for 1-2 reasons.
Chickpea is a frequently consumed member of the pulse plant family. It is the most commonly submitted Pod in South Asia and its third most popular edible bean. It is a vital basis of protein for many persons in evolving nations, notably in Asia's south region, where most people are vegetarians, either voluntarily or because of economic constraints (Gaur *et al*., 2010) [8].

Int.J.Curr.Microbiol.App.Sci (2020); Special Issue-10: 377-387

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-10 pp. 377-387**
Journal homepage: http://www.ijcmas.com

Original Research Article

Mitigation of Drought and Heat for Improving Productivity by Use of Foliar Application of Salicylic Acid in Chickpea

Raj Bahadur[1]*, Subhash Chandra Vimal[2], Adesh Kumar[3], N. A. Khan[4] and Neeraj Kumar[5]

[1]Department of Crop Physiology, [2]Department of Genetics of Plant Breeding
[3]Department of P. M. B. & G.E. [4]Department of P. M. B. & G.E.
[5]Department of Soil Science & Agricultural Chemistry,
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229 (U.P.), India

**Corresponding author*

ABSTRACT

Drought stress is a critical limiting factor in plant growth. Substances such as salicylic acid (SA) may enhance drought tolerance in plants. The present investigation focused on biochemical changes in JG14 and Dahod yellow seed by salicylic acid (SA) and Hydro-Priming with foliar application of SA and water in the drought and excessive moisture stress (EMS). The impacts on yields of chickpea bean were assessed for normal (3Novemaber 2014) and late (1 January 2015) sowing environments and foliar spray of salicylic acid (5 nano mole). Significantly higher yield parameters, yield, were recorded with foliar spray of salicylic acid. The experiment was Randomized Block Design (RBD) with six treatment viz, T_1-No treatments (control), T_2-Seed priming with salicylic acid (5 nano mole) till initiation of radicle (root), T_3- Foliar spray of water at 1st flower and one week after 1st flower T_4-Foliar spray of water at 50% podding one week after 50% podding, and two week after 50% podding, T_5-Foliar spray of salicylic acid (5 nano mole) at 1st flower and one week after 1st flower and T_6- Foliar spray of salicylic acid (5 nano mole) at 50% podding, one week after 50% podding, and two week after 50% podding. The highest seed yield (37.15 g in V1 and 46.49 g in V_2 plant^{-1}) was obtained by the treatment T_5-Foliar spray of salicylic acid (5 nano mole) at 1st flower and one week after 1st flower in the timely sown and 17.08 g in V_1 and 7.00 g in V_2 was found in late sowing treatment followed by treatment T_6- Foliar spray of salicylic acid (5 nano mole) at 50% podding, one week after 50% podding, and two week after 50% podding, grain yield plant^{-1} was recorded 27.70 (V_1) and 31.70 (V_2) g plant^{-1} and 8.27 (V_1) & 7.03 g (V_2) plant^{-1} in timely sown and late sown respectively presented in Table 2. Grain yield significantly increase over control 216.01% (V_1) & 206.46% (V_2) under normal sowing and 106.24% (V_1) and 59.62% (V_2)grain yield plant^{-1} under late sown condition, followed by T_6- Foliar spray of salicylic acid (5 nano mole) at 50% podding, one week after 50% podding, and two week after 50% podding normal sowing grain yield plant^{-1}, respectively.

Keywords

Foliar spray, Salicylic acid, Nano mole Podding and grain yield

Introduction

Chickpea (*Cicer arietinum* L.) is a legume belongs in the family, Fabaceae, subfamily Faboideae. It is one of the most widely consumed pulse legumes and ranking third after peas and soybean, and also covers a total of 15% of the world's pulse productions (Montenegro *et al.*, 2010). It is an important source of protein, carbohydrate, B-group

International Journal of Plant & Soil Science

34(13): 25-32, 2022; Article no.IJPSS.85682
ISSN: 2320-7035

Impact of Organic and Inorganic Nutrient Sources on Yield Attributes and Yield of Maize-Mustard Cropping System

Abhimanyu Yadav [a*≡], Awadhesh Kumar Singh [aΦ], Pankaj Singh [a≡], Nishant Singh [a≡], Kumar Anshuman [b≡] and Adesh Kumar [bΦ]

[a] *Department of Agricultural Chemistry and Soil Science, PG College, Ghazipur, Uttar Pradesh, India.*
[b] *Department of Soil Science and Agricultural Chemistry, ANDUA&T, Ayodhya, Uttar Pradesh, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i1330973

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/85682

Original Research Article

Received 25 January 2022
Accepted 05 April 2022
Published 12 April 2022

ABSTRACT

Soil quality deterioration, especially in intensive cropping system has become a serious problem for crop productivity. Consequently, strategies for sustainable crop production and soil health are urgently required. Therefore, a field experiment was conducted to study the impact of organic and inorganic nutrient sources on yield attributes and yield of maize-mustard cropping system during two consecutive *kharif* and *rabi* seasons of 2019-20 and 2020-21, respectively. The experiment was laid out in randomized block design assigning eight treatments of organic and inorganic nutrient sources comprising of (T_1) RDF (120:60:40 kg $N:P_2O_5:K_2O$ ha^{-1}), (T_2) RDF + Zn, (T_3) RDF + S, (T_4) RDF + Zn + S, (T_5) RDF + VC (5 t ha^{-1}), (T_6) RDF + VC (10 t ha^{-1}), (T_7) RDF + FYM (5 t ha^{-1}) and (T_8) RDF + FYM (10 t ha^{-1}) and were replicated thrice. The results reported that the higher yield attributes and yield of maize *viz.*, number of cobs $plant^{-1}$, number of seeds cob^{-1}, cob length, seed yield, stover yield and biological yield and for mustard *viz.*, siliquae $plant^{-1}$, number of seeds $siliquae^{-1}$, length of siliquae, seed yield, stover yield and biological yield were recorded with application of RDF + VC (10 t ha^{-1}) which was statistically at par with RDF + FYM (10 t ha^{-1}). However, seed index/test weight and harvest index of maize-mustard cropping was failed to show any significant effect due to above treatments.

[≡] *Research Scholar;*
[Φ] *Associate Professor;*
**Corresponding author: E-mail: abhimanyuyadav1049@gmail.com;*

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

CHARACTERIZATION OF SUBMERGENCE TOLERANCE TRAITS IN RICE (*ORYZA SATIVA* L.) GENOTYPES BY PHYSIO-BIOCHEMICAL APPROACHES.

Shambhoo Prasad[1]*, Ashish Kumar[1], Vishwas Mishra[1], Ajay Kumar[1], Sonam Singh, Vishwajeet Yadav[1], Adesh Kumar[1], N.A. Khan[1], D. K. Dwivedi[1] and Neeraj Kumar[2]

[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India

[2]Department of Agronomy, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India

Abstract

Four rice genotypes Nagina 22, Swarna sub1, NDR 9830102 and NDR 97 were for characterization of submergence related traits by physio-biochemical indices. Thirty five days old seedling of rice genotypes were exposed to 11 days complete submergence. The shoot elongation, catalase activity, total chlorophyll content and total soluble sugar were recorded just after desubmergence of rice genotypes. Swarna sub1 and NDR9830102 showed less shoot elongation, high catalase activity and less reduction in total soluble sugar and high survival percentage over Nagina 22 and NDR 97. Less shoot elongation preserve inherent energy and utilize it for survival. High catalase activity of Swarna sub1 and NDR9830102 prevent from oxidative damage just after desubmergence and and increased survival percentage of the plan. Nagina failed to survive due to high shoot elongation and oxidative damage.

Key word: Submergence, Survival, Stress, genotypes and shoot elongation.

Introduction

Rice (*Oryza sativa* L.) is the important primary cereal crop that has been extensively cultivated in most diverse ecosystem of the world, which accounts for more than 21% of the calorific needs of the world's population and up to 76% of the calorific intake of the population of South East Asia. It is widely grown in tropical and sub-tropical regions. It is primary source of the food for 57% of the world population and played a major role as a staple food for over 2.7 billion peoples worldwide (Khush and Virk, 2000).

Rice crops are prone to various types of stresses, both biotic and abiotic. Biotic stresses include insect pests, fungus, bacteria, viruses, and herbicide toxicity. Among abiotic stresses, drought, cold, submergence and salinity are also well studied in rice (Ansari *et al.*,2015). Rice production in these ecosystems depends mainly on monsoon rainfall and run-off water from the catchment areas (Zeigler and Puckridge, 1995).

Abiotic stress limits crop productivity (Araus *et al.*, 2002; Boyer, 1982), and plays a major role in determining the distribution of plant species across different types of environments. Abiotic stress and its effects on plants in both natural and agricultural settings is a topic that is receiving increasing attention because of the potential impacts of climate change on rainfall patterns and temperature extremes, salinization of agricultural lands by irrigation, and the overall need to maintain or increase agricultural productivity on marginal lands. In the field, a plant may experience several distinct abiotic stresses either concurrently or at different times through the growing season (Tester and Bacic, 2005).

Under rainfed lowland condition, among number of abiotic stress, submergence and drought are major ones and it affects rice production a lot. Drought and submergence are the two major limiting factors that reduce rice production. These two abiotic stresses can completely destroy crop production in extreme conditions, and consequently both of stresses are considered as key determinants of global food security. Rice is grown in a wide range of ecologies ranging from irrigated to uplands, rainfed lowland, deep water and tidal wetlands. About 29% of India's total rice area, i.e. 13 m ha is rainfed lowland, which contributes only 19% to national rice production. Rainfed lowlands constitute highly fragile ecosystems, always prone to flash-floods (submergence) with an average productivity of only 1.2 tonnes ha–1 in normal years and hardly 0.5 tonnes ha–1 in case of submergence (Sarkar *et al.*, 2009).

Submergence generally occurs at vegetative stage while drought at reproductive stage in frequent manners in life span of the crop. During submergence, tolerant rice plants exhibit inhibition of shoot elongation, retain chlorophyll in leaf tissues and maintain viability. If rice is submerged under water more than a few days, gradual loss of oxygen leads to withering and death due to the effect on respiration and photosynthesis. Water stress may affect on the plants anatomy, morphology, physiology and biochemistry and influence on almost all of their growth and development aspects (Ram et al., 2002; Reddy and Mitra, 2013).

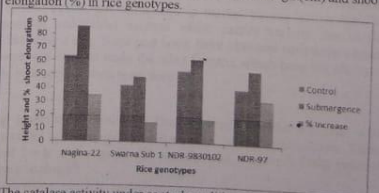
Materials and Methods

Four rice genotypes Nagina 22, Swarna sub1, NDR 9830102 and NDR 97 were selected to exposed complete submergence for characterization of submergence related traits by physio-biochemical indices. Seeds of rice genotypes were direct sown in pot condition in two sets with five replications as per CRD design. Finally, three seedlings were maintained in each pot for recording physio-biochemical parameters. All the standard cultural practices were followed as per norms during the crop growth. Submergence treatment was given to 35 days old seedling for 11 days complete submergence in submergence tank. Shoot elongation rate, catalase activity (Sinha, 1972), total chlorophyll content (SPAD 502 Plus Chlorophyll Meter) and total soluble sugar (Yemm and Willis, 1954) were recorded at the end submergence treatment against the control. Plant survival percentage was recorded after 20 days of desubmergence against control.

Results and Discussion

Under the eleven days complete submergence treatment, shoot elongated rate increases in all rice genotypes over control (Fig.1). High shoot elongation percent was recorded in Nagina 22 (34.5%) followed by NDR 97 (33.4) and NDR 9830102 (17.71). Least percent elongation was recorded at the end of submergence treatment in Swarna sub1 (10.6). The shoot elongation due to submergence was found to be high in susceptible varieties than the tolerant varieties (Singh *et al.*, 2001; Das et al., 2005). The level of shoot elongation during submergence depends upon the genetic characters of the cultivar and is affected by the submergence environment (Kawano *et al.*, 2009)

Fig.1: Effect of submergence treatment on plant height(cm) and shoot elongation (%) in rice genotypes.



The catalase activity under control condition was nearly same in rice genotypes but it abruptly increased just after desubmergence (Fig.2). High catalase activity was recorded in Swarna sub1 and NDR9830102 while less in Nagina 22 and NDR 97. observed a

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 8 [3] February 2019 : 91-95
©2019 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

ORIGINAL ARTICLE **OPEN ACCESS**

Effect of drought stress at reproductive stage of rice (*Oryza sativa* L.) genotypes.

Shambhoo Prasad[1]*, Ajay Kumar[1], Ashish Kumar[21], Vishwas Mishra[1], Krishna Kumar, Rakesh Dwivedi[1], Adesh Kumar[1] Chhathi Ram[2], Rohit Nandan[2],M. P. Singh[2] and D. K. Dwivedi[1]
[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
[2]Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India.

ABSTRACT

A pot experiment was conducted with five rice genotypes to evaluate rice genotype at reproductive stage drought stress. Rice genotypes were exposed to 15 days drought at reproductive stage by receding the water. The leaf rolling, relative water content (RWC) leaf, total chlorophyll content (SPAD) and leaf proline content were recorded at the end of drought. Less leaf rolling and less reduction in RWC and SPAD value and high proline content were recorded in Nagina 22 over other genotypes. Swarna sub1 was the most susceptible rice genotype as it showed high leaf rolling and more reduction in RWC and SPAD value and less accumulation in proline content.

Key word: *Drought, Genotypes, Stress and Yield*

Received 11.12.2018 Revised 04.01.2019 Accepted 11.01.2019

INTRODUCTION

Drought is one of the important abiotic stresses that severely effects on growth, development, and metabolism renfed areas [7]. Drought is an abiotic stress which affects plants at various levels and stages of their life period. But drought stress at reproductive stage is more serious than any other stage. The drought stress not only affects plant–water relations through the reduction of water content, turgor, and total water, but it also affects stomatal closure, limits gas exchange, reduces transpiration, and disturbs photosynthesis and ultimately yield of the plant [17]. A low water potential effect of on mineral nutrition and plant metabolism which decrease the leaf area and alter assimilates partitioning among the plant organs [15, 19].

Rice varieties have differential responses to abiotic stresses because of the complexity of interactions between stress factors and various molecular, biochemical, and physiological processes that affect plant growth and development [20, 21]. Drought stress affects the growth behavior and yield and yield components irrespective rice genotypes [20]. Drought stress due to water deficit is a common constraint in upland cultivation systems of plants [9, 10]. Drought stress reduces the rice growth and severely affects different traits, such as seedling biomass, stomatal conductance, photosynthesis, starch metabolism, and plant–water relations [12, 14, 16, 18]. Rice genotypes have differential response to water deficit 6]. Grain yield of some rice varieties was reduced by up to 81 % under drought condition and this reduction depended on timing, duration, and severity of the plant water stress [14, 18]. When rice genotyped exposed to water deficit; panicle length and fertile grains in two tolerant varieties were not significantly decreased, leading to greater productivity than in two sensitive cultivars.

MATERIALS AND METHODS

Five rice genotypes Nagina 22, Swarna sub1, NDR 97, Sushk Samrat and NDR 9830102 were selected to give heat treatment at reproductive stage. Rice genotypes were sown in pot condition two sets with five replication as per CRD design. All the standard cultural practices were followed as per norms during the crop growth. Drought treatment was given for 15 days at reproductive stage by receding the water. Leaf rolling (IIRI Scale), RWC (Slatyer, 1967), total chlorophyll content (chlorophyll meter) and proline

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; SP1: 335-339

Arun Kumar
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Deepak Kuma
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

SKZ Rizvi
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Ajit Tiwari
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Akanksha Singh,
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Adesh kumar
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Shambhoo Prasad
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

K N Singh
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Correspondence
Arun Kumar
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Effect of processing on phytic acid content and iron availability in selected rice variety

Arun Kumar, Deepak Kuma, SKZ Rizvi, Ajit Tiwari, Akanksha Singh, Adesh Kumar, Shambhoo Prasad and KN Singh

Abstract
Rice (*Oryza sativa* L.) which belongs to the family of grasses, Poaceae, is the main food source for more than two-third of the world's population especially in Southeast Asia. Nutrient paucity due to unavailability of quality food sources is a major impediment to the progress in improvement in the field of human nutrition. Phytic acid is a major anti nutritional factor that binds with cationic nutrients like zinc and iron, and makes them unavailable for human intestinal absorption. Iron is the important nutrients required for human growth and development. This study was aimed to know the effect of soaking on phytic acid contents. Minimum phytic acid measured in the Sarjoo-52 was 5.61 g/kg and maximum phytic acid measured in the Swarna was 9.12 g/kg followed by NDR-359 was 8.05 g/kg. After processing in case of after soaking minimum phytic acid content measured in the Sarjoo-52 was 3.63 g/kg and maximum phytic acid content in parents after soaking measured in Swarna was 6.76 g/kg. Minimum phytic acid content after germination measured in the Sarjoo-52 was 3.08 g/kg and maximum phytic acid content in parents after germination measured in Swarna was 6.05 g/kg. The soaking treatment reduced the inherent phytic acid content in seeds of rice. The highest iron was obtained in sarjoo-52 (24.15 ppm) and lowest obtained in swarna (12.48 ppm).

Keywords: processing, rice, nutrients, phytic acid, iron

Introduction
Rice grain is the staple food for more than half of the world's population and grows in more than 100 countries. The top 10 rice producing countries in the world today are India, China, Indonesia, Bangladesh, Thailand, Vietnam, Burma, Philippines, Cambodia, and Pakistan. China, India, Indonesia, Bangladesh, Thailand, and Vietnam produce about 80 percent of the world rice production. Among the rice producing countries, India ranks second in total production (90.00 million tonnes) next to China (184.25 million tonnes) with an average productivity of 3.09 t/ ha-1 (FAO, 2013) [2]. Nutrient deficiencies have plagued the world's population from ancient days. The number and proportion of undernourished people in the world is estimated to be 870 million and 13% of the population respectively (WHO report, 2014) [47].

In the last few years, food scientists have laid an emphasis on the effects of mineral nutrient deficiencies and it has become increasingly evident that the lack of minerals may have similarly severe negative consequences on human health (Bouis 2000) [3]. These deficiencies have major negative effects on human health, and development; working ability and quality of life (Welch and Graham 2004; Shailen *et al*., 2005; Anne and Paula 2006; White and Brown, 2010) [43, 38, 1, 46]. Although micronutrient requirement is very small, every one in three humans worldwide is not getting enough quantity, especially the poor, women and children (Gibson 1994; Ramakrishna *et al*., 2006) [32].

Phytic acid (PA) or myo-inositol hexaphosphate is a strong chelator of multivalent metal ions, especially iron, zinc and calcium (Hurrel, 2004) [15]. For many years, phytic acid was considered an antinutritional compound because it reduces the bioavailability of several minerals important for human nutrition (Bohn *et al*., 2007; Li *et al*., 2008; Schelemmer *et al*., 2009) [4, 37]. However, since the 1990s, phytic acid has been scientifically emphasized for its beneficial effects on human health, particularly in the prevention of diabetes (Lee *et al*., 2006) [21], Renal calculi (Saw *et al*., 2007) [35], Parkinson's disease (Xu *et al*., 2008) [48] and cancer (Vucenik and Shamsuddin, 2006). The application of 0.50% PA acid rice bran added to the drinking water after tumor induction, reduced the risk of colon cancer in rats (Norazalina *et al*., 2009). Its antioxidant effect, described by several researchers (Lee and Hendricks, 1995; Soares *et al*., 2004; Stodolak *et al*., 2007; Harbach *et al*., 2007) [22, 39, 40, 12], is due to its ability to inhibit the formation of hydroxyl radicals and to form chelates with Fe2+ ions, causing them

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(2): 10-13
© 2019 JEZS
Received: 04-01-2019
Accepted: 06-02-2019

Divya Srivastava
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Adesh Kumar
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Ashutosh Tiwari
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Praveen Tiwari
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Nandan Singh
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Jaswant Singh
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Bhawana Mathur
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Divya Srivastava
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Phenotypic and biochemical characterization of microorganisms associated with the entomopathogenicity against *Helicoverpa armigera* and selection of best potent bacteria having insecticidal activity

Divya Srivastava, Adesh Kumar, Ashutosh Tiwari, Praveen Tiwari, Nandan Singh, Jaswant Singh and Bhawana Mathur

Abstract
There was a sum of four strains which were found to be entomopathogenic against *Helicoverpa armigera*. All of these bacterial strains were gram positive endospore forming strains. In the present study, the phenotypic and biochemical nature of all larvicidal strains was studied followed by a leaf based bioassay to obtain the best potent strain. As a result of this study, 4c culture was found to be best potent as 100% mortality was observed.

Keywords: *Helicoverpa armigera*, gram pod borer, bio-insecticide, bio-control of insect, microbes based insecticide

Introduction
Helicoverpa armigera is n economic important insect pest which is also known as gram pod borer. It plays a detrimental role and damage the complete chickpea crop. Chickpea is the world's third most important pulse crop. This pod borer, *Helicoverpa armigera* is highly poly phagous in nature and attacks over 182 plants species as cotton, maize, tobacco, pigeon pea, chickpea and tomato etc. [1]. So it is a harmful pest for both, widely grown and economically important crops. The yield loss in chickpea due to pod borer was reported as 10-60 per cent in normal weather conditions [2]. It attacks on the pod of the chickpea which is consumed by a huge number of public and agriculturalist face this problem as it is one of the main food crop of developing nation including India. As this damage is caused during flowering and pod formation stages so it results in substantial yield loss [3]. There are a number of chemical pesticides available to control this insect pest but chemicals are harmful for complete eco-system so there biological control agents got introduced in market among which *Bacillus thuringiensis* is the most popular insecticidal bacteria which causes toxicity due to the presence of crystal proteins. But now a day, these pod borer have obtained resistance against *Bt.* based bio-control. This work was done to study the other bacteria which have the ability to act as a bio-control and all the biochemical tests were done.

Materials and Methods
Bacterial culture showing insecticidal activity: The entomopathogenic bacteria were isolated and analysed using a castor leaves based test coated with the bacterial cultures. These leaves were fed by larvae of borer and insecticidal activity was observed. Only positive cultures were selected for future studies [4].

Media to study colony morphology and phenotypic characteristic: Nutrient agar media was used. The selected strains were subcultured on Nutrient agar plated and their morphology was observed as shown in Table 1 and fig 1.

Biochemical Analysis
Motility test, Methyl red and Voges-proskaeur tests were performed following Olutiola *et al.*, 2000 [5] and Catalase test, Indole test and Oxidase tests were performed following Cheesbrough, M, 2006 [6].

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(5): 1202-1206
© 2020 IJCS
Received: 17-05-2020
Accepted: 22-06-2020

Shalini Srivastava
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Adesh Kumar
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Kusum Sharma
ICAR-Indian Institute of Pulses Research, Kalyanpur, Kanpur, Uttar Pradesh, India

Minakshi Tiwari
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Niyaz Ahamd
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Kirti Srivastava
Krishi Vigyan Kendra, Agriculture Research Institute, Mau Nath Bhanjan, Uttar Pradesh, India

Bandana Jaiswal
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ankit Srivastva
National Bureau of Agriculturally Important Microorganisms, Mau Nath Bhanjan, Uttar Pradesh, India

Dr. Raj Bahadur
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ved Prakash
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sushil Kumar
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Jaipal
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Shalini Srivastava
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Role of biocontrol agents on chlorophyll content in wilt affected lentil crop

Shalini Srivastava, Adesh Kumar, Kusum Sharma, Minakshi Tiwari, Niyaz Ahamd, Kirti Srivastava, Bandana Jaiswal, Ankit Srivastva, Dr. Raj Bahadur, Ved Prakash, Sushil Kumar and Jaipal

DOI: https://doi.org/10.22271/chemi.2020.v8.i5q.10465

Abstract
In the present study biocontrol agents *Bacillus safensis* and *Bacillus licheniformis* has been isolated from wilt affected lentil crop of agro-climatic zone of eastern UP like Faizabad, Mau, Varanasi, Gazipur.Lentil seed treatment has been given by these isolated strains as bioagents against wilt pathogen in pot experiment in lentil crop Rabi-season 2019-2020.Result of conducted pot experiment showed the maximum chlorophyll content was found in T3 (*Bacillus safensis* +*Bacillus licheniformis* +*Fusarium oxyporum f.sp lentis*+Lentil Rasistant variety IPL-316 + Susceptible variety K-75) followed by treatments T2 (*Bacillus licheniformis* +Resistant Variety IPL-316+Susceptible variety K-75) and T1 (*Bacillus safensis* +Lentil Resistant variety IPL-316 + Susceptible Variety K-75)' as compare to negative control T5 (Lentil Resistant variety IPL-316 + Susceptible Variety K-75+No bacterium inoculum) and pathogen T4(*Fusarium oxysporum f.spp.lentis* + Resistant variety IPL-316 + Susceptible Variety K-75. The aim of this paper is to study the bio-agent's factor affecting the chlorophyll content and provide protection against pathogen in lentil plant. After that chlorophyll estimation test was performed on treated lentil crop on 30, 60 and 90 days. We observed chlorophyll content in treated crops and maximum chlorophyll content was found at 30 and 60 *days which minimize at 90 days*.

Keywords: *Bacillus safensis, Bacillus licheniformis, Fusarium oxysporum f.spp. lentis*, Lentil seed resistant variety (IPL-316), Lentil seed susceptible variety (K-75)

Introduction
Lentil (*Lens culinaris Medik.*) is a member of Leguminaceae family and commonly known as legume, masoor or poor man's meat. The global production of lentil has reached nearly 5.0 million tonnes in 2014 (Ahmad Nasim 2018) [4]. It is the second largest growing rabi pulse after chickpea in India. Lentils *(Lens culinaris Medikus*) produces commonly in cold weather which is an important pulse crop grown widely throughout the Indian subcontinent, Canada, Turkey, Australia, USA, Nepal, China and Ethiopia. About 80 percent of the lentil production in India during 2015-16 has been reported from Madhya Pradesh (30.94%), Uttar Pradesh (28.72%), Bihar (15.24%) and West Bengal (5.81%) (Ahmad *et al*., 2018). Lentil has a high nutritional value and major source of dietary proteins (25%) after soyabeans in humans and animal diet (Rahman *et.al*., 2010) [3] and also plays a significant role in the improvement of soil fertility (Frederick *et al*., 2006) [1].
Fusarium wilt disease caused by pathogen *Fusarium oxysporum f.sp. lentis* is the most important biological constraints to productivity of lentil worldwide (Bhalla *et al*., 1992) [2] and is considered as to be the most important biotic stress affecting the crop's productivlty (Khare, 1981) [7]. It is a soil borne root pathogen, colonizing the xylem vessels and blocking them completely and in this way it prevents water to reach towards the other parts of the crop. Wilt symptoms appear from flowering to late pod-filling stage and are characterized by sudden drooping of top leaflets of the affected plant, leaflet closure without premature shedding, dull green foliage followed by wilting of the whole plant or individual branches. This pathogen can cause infection at all the stages of plant growth with more incidences at flowering and podding stages than early vegetative stage (Chavdarov, 2006) [8]. As the pathogen *F. oxysporum* can survive for longer period in soil and difficult to eliminate, it may cause severe obstructs to the plant's xylem hence deficit the water in leaves and also lowers the gas exchange properties

Int.J.Curr.Microbiol.App.Sci (2020) 9(1): 994-999

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 9 Number 1 (2020)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2020.901.112

Effect of Submergence Stress on Physiological Indices and Yield of Rice (*Oryza sativa* L.) Genotypes

Ashish Kumar*, Shambhoo Prasad, Vishwash Kumar Mishra, Rahul Kumar, Jaswant Singh, Ram milan and Adesh Kumar

Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture & Technology Kumarganj, Ayodhya-224229 (U.P.) India

Keywords

Rice, Submergence stress, Catalase, Peroxidase, Shoot elongation

Article Info

Accepted:
15 December 2019
Available Online:
20 January 2020

A B S T R A C T

An experiment was conducted with four rice genotypes Swarna Sub1, Nagina-22, NDR-102 and NDR-97 submergence related traits at the student's instructional farm of Narendra Deva University of agriculture and technology, Kumarganj Ayodhya (U.P). Thirty five days old direct seeded rice seedlings was exposed to 11 days complete submergence treatment. Shoot elongation rate, catalase and peroxidase activity was recorded at the end of submergence treatment. Less shoot elongation and high catalase activity were recorded in Swarna Sub1 and NDR-102 while Nagina-22 and NDR-97 showes high reduction and less increase respectively. Swarna Sub1and NDR-102 showed fast recovery after desubmergence. NDR-97 poorly survived and Nagina-22 fail to survive during submergence period. Days to 50% flowering was less affected in Swarna Sub1 and NDR-102 it delayed in case of NDR-97.Grain yield per plant was highly affected in NDR-97 while less in Swarna Sub1 and NDR-102.

Introduction

Rice is the world's single most important food crops and primary food source for one third of the world population. Within the country, rice occupies 1/3 of the total cropped area, contributes about 40 to 43% of total food grain production and continues to play a key role in the national food and livelihood security system. India rank second among the top most rice producers in the world after China. Rice crops are prone to various types of stresses, both biotic and abiotic. Biotic stresses include insect pests, fungus, bacteria, viruses, and herbicide toxicity Among abiotic stresses, drought, cold, submergence and salinity are also well studied in rice (Ansari *et al*., 2015).

Submergence and drought are the two most

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR KDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

ASSESSMENT OF RHIZOBACTERIA ASSOCIATED WITH WHEAT RHIZOSPHERE FOR GROWTH PROMOTION

Parmanand Kumar[1], Adesh Kumar*[1], Arun Kumar[1], Divya Srivastava[1], Shalini Srivastava[1], Jaswant Singh[1], Bhavana Mathur[2], Shambhoo Prasad[3], Pankaj Kumar[2], S.K.Singh[4] and R.K Yadav[5]

[1]Department of plant Molecular Biology & Genetic Engineering, [2]Directorate of Extension, [3]Department of Plant Pathology, [4]Department of Crop Physiology, N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Faizabad -224 229 (U.P.) India

Abstract

Twenty six isolates of wheat rhizosphere were characterized on the basis of biochemical features like IAA production, ammonia production and P Solubilization. The quantitative IAA production was recorded in all test isolates. Production of IAA from the isolates ranged between 54.00 µg/ml to141.60 µg/ml. Wheat PGPR isolates were also evaluated for their efficiency to promote plant growth under pot condition. The maximum increase in seed germination (300%) was recorded over control. Seed inoculation by wheat PGPR isolates led to maximum increase in root length (47.59%), shoot length (131.89%), root fresh weight (51.74%), shoot fresh weight (68.97%), root dry weight (31.89%) and shoot dry weight (60.58%).The protein profiling of isolates by SDS-PAGE was done to differentiate the proteomic variability based on polymorphism.

Key words: Wheat rhizobacteria, IAA, Plant growth promoting traits, Seed germination, Pot experiment.

IntroductionWheat (*Triticum aestivum*) belongs to order Poales (*Glumiflorae*), family *Poaceae* (Graminae), tribe *Triticaceae* and it is considered as one of the most important staple crops across the globe. It is widely cultivated and domesticated cereal. However, it needs a substantial increase in its productivity to meet the demands of increasing population. Next to rice, wheat provides more calories than any other crop and a good source of high quality protein and dietary fibre. Increasing wheat production in the past has been dependent in part on the availability of nitrogenous fertilizers, however, systems that do not rely heavily on substantial fertilization (Armstrong *et al.* 1997). The rhizosphere bacteria provide many services to increase plant productivity. PGPR have the ability to promote the growth directly by producing different substances such as phytohormones, ammonia production, HCN, phosphate solubilization and fixing N_2 (Van Rhijn and Vanderleyden 1995, Ferdaous *et al.*, 2017) or indirectly by producing antibiotics to control pathogens (Milner *et al.* 1996). Many rhizobacteria secrete a variety of antifungal molecules under in vitro and in situ conditions. There are several reports of in vitro antagonism of pathogenic fungi and field performance by bacteria recovered from the rhizosphere of plants in India. The quantitative estimation of IAA production ability of selected soil isolates on nutrient agar broth was carried out by Vishwakarma *et al.*, 2017. Growth promoting rhizobacteria can modify the root architecture (Remans *et al.* 2008) that may function in increasing plant productivity and nutrient acquisition efficiency (Shahzeona *et al.* 2008). Hence, PGPR applications have been extensively studied and used to enhance the plant growth. They are able to produce the important bacterial enzyme ACC deaminase under different conditions including stress, which can effectively control the stresses. Rhizobacteria releases the enzyme ACC deaminase whose activity is responsible for the stimulation of plant growth. ACC is the immediate precursor of ethylene in plants and therefore lowering of the level of ethylene resulting in root elongation. Various species of bacteria like *Pseudomonas, Azospirillum, Azotobacter, Klebsiella, Enterobacter, Alcaligenes, Arthrobacter, Burkholderia, Bacillus* and *Serratia* have been reported to actively colonize wheat plant roots region and increase plant growth and yield (Cheoug *et al.*, 2017). The PGPR strains show useful traits which can enhance the plant growth without any undesirable effect on the environment. So, the use of PGPRs as plant growth enhancer may indirectly reduce the use of chemical fertilizers. Therefore, the study has become essential to investigate PGPRs associated with wheat in order to enhance the wheat production with the aim to limit the use of chemical fertilizers.

Materials and Methods

Soil sample collection and isolation of rhizobacteria from wheat The root adhering soil (RAS) samples were collected from wheat crop. The soils were sampled from different locations in the districts viz., Faizabad (FZD), Mucunfiw sugar (MUS), Barabanki (BBK), Lucknow (LKO), Kanpur Dehat (KNP) and Jhanpur (JAN) of Uttar Pradesh, India. Serial dilutions were made up to 10^{-4} of each samples. 10^{-3} and 10^{-4} dilution were plated on to three media, Jensen's medium, King's B (KB) medium and Nutrient agar (NA) medium. Plates were incubated at 28°C for 72 hours. A total of 26 rhizobacterial isolates selected on the basis of morphological traits like form, elevation, margin, color, appearance, texture and surface.

Screening of wheat rhizospheric bacteria for plant growth promoting attributes

Quantitative estimation of IAA

Culture isolates were incubated at 28°C for 24 hrs in Luria Bertani (LB) broth. Cells were removed from the media by centrifugation at 10,000 rpm for 15 minutes. The Ortho-phosphoric acid (2-3 drops) was added to 2ml of supernatant and was mixed vigorously with 4ml of Salkowski's reagent (0.5M solution prepared in 50ml of 35% $HClO_4$) and incubated at room temperature for 25 minutes at 37°C temperature in water bath and observed for the color formation (Fischer, *et al.*, 2007). The optical density was taken at 530 nm and concentration of IAA in supernatant was calculated.

Ammonia production

Isolates were incubated for 4 days in peptone water (Peptone 10 g, NaCl 5g in litre, pH 7.0). Nessler's reagent (1ml) was added in each tube and observed for color formation (Shuferaw *et al.*, 2004).

Phosphate Solubilization

The plates were prepared with Pikovskaya's medium. All the bacterial isolates spot inoculated on the surface of Pikovskaya's agar plate and phosphate solubilizing activity was estimated after 4 days of incubation at 28°C. Phosphate solubilization activity was determined by the development of the clear zone around the bacterial colonies (Tsiore, 1996).

Seed germination test:

The seeds were surface sterilized with 0.1% $HgCl_2$ for 3 minute followed by successive washing was done with sterile distilled water. The seeds were treated with rhizobacterial cultures (Grown in their respective medium for 48 hours containing atleast 10^8 cells/ml) for 10 minutes. The plates were prepared with 0.8% sterile agar medium. The seeds were placed on soft agar plates and incubated at 30° C for 2-3 days. In control plates, seeds were treated with sterilized medium alone. After 3 days, the data was recorded on seed germination.

Pot experiment

Soil was collected, air dried, sieved (2mm) (6-mesh) and sterilized by repeated autoclaving before filling into pots. Wheat seeds were surface sterilized by exposing to 95% ethanol and immersing in 0.2% $HgCl_2$ solution for 3 minute. The seeds were then subjected to 5 washing with sterile distilled water. The seeds were dipped for 10 minutes in overnight grown bacterial suspension then seeds were transferred to pots containing sterile soil to a depth of 5 mm. Six seeds were sown in each pot and the experiment was performed in duplicate for each isolate. Sterile seeds treated with non-inoculated media were used as control. The pots were kept in sunlight and were

International Journal of Chemical Studies 2018; 6(6): 1370-1373

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(6): 1370-1373
© 2018 IJCS
Received: 05-09-2018
Accepted: 10-10-2018

Abhimanyu Yadav
Department of Soil Science & Agril. Chemistry, P. G. College, Ghazipur, Uttar Pradesh, India

Adesh Kumar
Department of Soil Science & Agril. Chemistry, NDUAT, Faizabad, Uttar Pradesh, India

Lalit Krishna Yadav
Department of Soil Science & Agril. Chemistry, CSAUAT, Kanpur, Uttar Pradesh, India

Pramod Kumar
Department of Agronomy, CSAUAT, Kanpur, Uttar Pradesh, India

Ashok Kumar
Department of Soil Science & Agril. Chemistry, CSAUAT, Kanpur, Uttar Pradesh, India

Awadhesh Kumar Singh
Department of Soil Science & Agril. Chemistry, P. G. College, Ghazipur, Uttar Pradesh, India

NK Arora
Division of Soil and Crop Management, CSSRI, Karnal, Haryana, India

Correspondence
Abhimanyu Yadav
Department of Soil Science & Agril. Chemistry, P. G. College, Ghazipur, Uttar Pradesh, India

Evaluation of integrated nutrient management in respect to yield, microbial population, nutrient content and uptake by wheat (*Triticum aestivum* L.) under eastern Uttar Pradesh

Abhimanyu Yadav, Adesh Kumar, Lalit Krishna Yadav, Pramod Kumar, Ashok Kumar, Awadhesh Kumar Singh and NK Arora

Abstract
Field experiment was carried out in randomized block design with three replications and the treatment consisted of T_1- control, T_2- 100% RDF (120:60:40 kg ha^{-1} N: P_2O_5: K_2O); T_3- 75% RDF, T_4- 75 % RDF + 25 % N-FYM, T_5- 75% RDF+ Bio-fertilizer (*Azotobactor*), T_6- 50% RDF + 50 % N-FYM, T_7- (50 % RDF + 50 %N-FYM + PSB) and T_8- 50 % RDF + *Azotobacter* + PSB. The treatment effect was compared based on yield, soil microbial population, nutrient content, protein content and nutrient uptake by wheat crop. The grain and straw yield (q ha^{-1}), soil microbial population, nutrient content, protein content and uptake of nitrogen, phosphorus and potassium were maximum under T_7, which was at par with T_2 T_4 and T_6 and significantly superior over T_1, T_3, T_5 and T_8.
The maximum grain and straw yield of wheat (41.90 & 60.65 q ha^{-1}) was recorded with T_7 which was significantly higher over than T_1 (17.90 & 26.5 q ha^{-1}), T_3 (32.84 & 49.09 q ha^{-1}), T_5 (35.64 & 53.0 q ha^{-1}) and T_8 (34.80 & 51.75 q ha^{-1}) while at par with T_2 (41.60 & 60.33 q ha^{-1}) T_4 (39.55 & 57.0 q ha^{-1}) and T_6 (39.88 & 57.15 q ha^{-1}). Maximum number of bacteria (39.38 X 10^7 g^{-1} soil) was recorded in T_7 (50 % RDF + 50 % N-FYM + PSB) which was statistically at par with value recorded in T_6 (50 % RDF + 50 % N-FYM). Treatment T_7 and T_6 were found significantly higher over rest of treatments while the minimum number (6.21 X 10^7 g^{-1} soil) of bacteria was recorded under treatment T_1 (control). Similar trend also reported in the population of fungi and Actinomycetes in the soil after harvest of wheat crop. The maximum NPK content in grain (1.82, 0.50and 0.54 %) and in straw (0.55, 0.13 and 1.52 %) was observed under treatment T_7 (50 % RDF + 50 % N- FYM + PSB) and minimum NPK content in straw (1.53, 0.43 and 0.50 %) and in straw (0.49, 0.10 and 1.43 %) was observed under treatment T_1 (control). The maximum protein content (11.38 %) was observed in treatment T_7 (50% RDF + 50% N-FYM + PSB) which was statistically at par with treatments T_2, T_4, T_5 and T_6 and significantly superior over treatments T_1 (control), T_3 and T_8 while the minimum protein content (9.56 %) was recorded under treatment T_1 (control). The maximum uptake of N (110.12 kg ha^{-1}), P (28.83 kg ha^{-1}) and K (114.81 kg ha^{-1}) were observed under treatment T_7 (50 % RDF + 50 % N-FYM + PSB). While minimum uptake of N (40.37 kg ha^{-1}), P (10.35 kg ha^{-1}) and K (46.85 kg ha^{-1}) were observed under T_1 (Control).

Keywords: wheat, yield, FYM, PSB, azotobactor and RDF etc

Introduction
Wheat (*Triticum aestivum* L.) is the first important strategic cereal crop for the majority of world's populations. It is the most important staple food of the world. It exceeds in acreage and production every other grain crop (including rice and maize) and is therefore, the most important cereal grain of the world, which is cultivated over a wide range of climatic conditions. India has achieved self-sufficiency in food production at present, but the realistic demand for food has been estimated at 301.08 million tons for 2020, which will reach 330.18 million tons by the year 2030 (Goyal and Singh 2002). About 91% of the total wheat production is contributed by northern states. India is one of the principal wheat producing and consuming country in the world.
Adoption of intensive cropping system will meet the food demands of increasing population, requires high input energy, which are not only responsible for environment degradation but also increased the cost of cultivation. The manufacture of chemical fertilizer is highly cost effective and depends on non-renewable fossil fuel that is in acute shortage. To compensate the supply and recent price hike in inorganic fertilizers,

RESEARCH ARTICLE

ISOLATION AND CHARACTERIZATION OF ANTAGONISTIC RHIZOSPHERIC BACTERIA FROM LENTIL

Niyaj Ahamad*, Adesh Kumar, Km. Komal, and D.K. Dwivedi

Department of Plant Molecular Biology and Genetic Engineering
Acharya Narendra Deva University of Agriculture and Technology,
Kumarganj, Ayodhya 224229, U.P., India

Received-08.02.2022, Revised-22.02.2022, Accepted-14.03.2022

Abstract: Sixteen lentil rhizobacteria were isolated at nutrient agar medium. Out of which, twelve isolates showed antagonistic activity against *Fusarium oxysporum* f.sp. *lentis*. All the antagonistic isolates produced diffusible and volatile antifungal metabolites. The isolates 10 and 14 showed a maximum antagonism 72% and 68.6% respectively. All the antagonistic isolates showed PGPR activity such as phosphate solubilization, IAA production and ammonia production. Isolates produced IAA ranging from 1.25 to 3.61 ug/ml. The highest amount of IAA was produced by isolate 14.

Keywords: Antagonistic activity, PGPR, *Fusarium oxysporum* f. sp. *lentis*, PGP traits

INTRODUCTION

Lentil (*Lens culinaris* Medik.) is the second most important grain legume widely cultivated in semi-arid regions of the world (Malik 2005). Cultivation of lentil attributes the soil by enriching the soil nutrients by the help of nitrogen fixation, carbon and organic matter accumulation which promotes proceeding crop production and productivity. The crop production reduces due to suffering from various plant diseases caused by fungi, viruses, nematodes, insect pests and parasitic weeds ultimately resulted in huge economic losses. Lentil *Fusarium* wilt caused by *Fusarium oxysporum* f.sp. *lentis* plays a major role in limiting the yield potential and causes severe damage of leaves, pods, stems and roots (Pouralibaba *et al.* 2015; Singh, 2015). Lentil legume has ability to fix atmospheric nitrogen into a biologically useful form by the symbiotic association of rhizobacteria. Several environmental conditions limits the symbiotic relations resulting reduced nitrogen fixing system, application of plant protective chemicals, fertilizers are harmful for plant and bacteria both (Andres, 2012). The rhizosphere is the narrow zone of soil influenced by the root system of plant and populated with variety of microorganisms and the bacteria colonizing this zone is known as rhizobacteria (Beneduzi*et al.* 2012).The plant growth promoting rhizobacteria have the capability to stimulate the plant growth by the root colonization and exert beneficial effects on the plant (Sulsowe*t al.* 1979) by increasing plant-microbe symbiosis, competition for nutrients, root colonization space and limit the activities of plant pathogens (Glick 1995; Lugtenberg 2002). PGPRs have both the mechanisms of direct and indirect. Direct mechanism of PGPR consists of phosphate solubilization, nitrogen fixation, Ammonia production, Siderophore production and procurement of plant hormones like auxins, cytokinins and gibberellins and limiting the ethylene by ACC deaminase activity. In order to indirect mechanism of PGPRs consists of pathogen suppression by means of production of enzymes and compounds like chitinase, protease, cellulose, antibiotics, HCN, ammonia and volatile organic compound *etc*.Plant growth promoting rhizobacteria can biologically fix nitrogen, solubilize phosphate and maintains the proper level of phytohormones such as Idole acetic acid that help in the improvement of lentil (Rani *et al.* 2012).Rhizospheric bacteria can promote root growth and yield and play an alternative role to increase abiotic stress tolerance in legumes (Rashid *et al.*, 2012, Sarma and Saikia 2014). Plant growth promoting rhizobacteria can increase growth by variety of mechanisms, such as nitrogen fixation, phosphate solubilization, and phytohormone production (Rashid *et al.*, 2012). Some bacteria synthesizes indole acetic acid (IAA) hormone which regulates the growth and development of the plant, act as signal molecule that control the expression of several genes (Ducae*t al.*, 2014). Plant growth promoting bacteria colonize the roots of plant rhizosphere that enhances the plant growth. Rhizospheric microbial population is different from its surroundings due to root exudates that function as a source of nutrients for microbial growth (Burdmane*t al.*, 2000). PGPR enhance the plant growth by the control of phytopahtogenic agents, primarily by the production of metabolites that contribute to the antibiosis and antifungal properties that acts as defence systems. The mechanism would involve the production of hydrolytic enzymes, such as chitinase and glucanase producing bacteria could inhibit fungal growth (Kumar *et al.*, 2010).
Thus, the identification and characterization of PGPR populations indigenous to leguminous rhizosphere are therefore, to characterize these isolates on the basis of morphology and determination of PGPR properties along with antifungal activity.

*Corresponding Author

Journal of Entomology and Zoology Studies 2019; 7(2): 10-13

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(2): 10-13
© 2019 JEZS
Received: 04-01-2019
Accepted: 06-02-2019

Divya Srivastava
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Adesh Kumar
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Ashutosh Tiwari
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Praveen Tiwari
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Nandan Singh
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Jaswant Singh
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Bhawana Mathur
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Divya Srivastava
Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Sciences, Kumarganj, Faizabad, Uttar Pradesh, India

Phenotypic and biochemical characterization of microorganisms associated with the entomopathogenicity against *Helicoverpa armigera* and selection of best potent bacteria having insecticidal activity

Divya Srivastava, Adesh Kumar, Ashutosh Tiwari, Praveen Tiwari, Nandan Singh, Jaswant Singh and Bhawana Mathur

Abstract
There was a sum of four strains which were found to be entomopathogenic against *Helicoverpa armigera*. All of these bacterial strains were gram positive endospore forming strains. In the present study, the phenotypic and biochemical nature of all larvicidal strains was studied followed by a leaf based bioassay to obtain the best potent strain. As a result of this study, 4c culture was found to be best potent as 100% mortality was observed.

Keywords: *Helicoverpa armigera*, gram pod borer, bio-insecticide, bio-control of insect, microbes based insecticide

Introduction
Helicoverpa armigera is n economic important insect pest which is also known as gram pod borer. It plays a detrimental role and damage the complete chickpea crop. Chickpea is the world's third most important pulse crop. This pod borer, *Helicoverpa armigera* is highly poly phagous in nature and attacks over 182 plants species as cotton, maize, tobacco, pigeon pea, chickpea and tomato etc. [1]. So it is a harmful pest for both, widely grown and economically important crops. The yield loss in chickpea due to pod borer was reported as 10-60 per cent in normal weather conditions [2]. It attacks on the pod of the chickpea which is consumed by a huge number of public and agriculturalist face this problem as it is one of the main food crop of developing nation including India. As this damage is caused during flowering and pod formation stages so it results in substantial yield loss [3]. There are a number of chemical pesticides available to control this insect pest but chemicals are harmful for complete eco-system so there biological control agents got introduced in market among which *Bacillus thuringiensis* is the most popular insecticidal bacteria which causes toxicity due to the presence of crystal proteins. But now a day, these pod borer have obtained resistance against *Bt.* based bio-control. This work was done to study the other bacteria which have the ability to act as a bio-control and all the biochemical tests were done.

Materials and Methods
Bacterial culture showing insecticidal activity: The entomopathogenic bacteria were isolated and analysed using a castor leaves based test coated with the bacterial cultures. These leaves were fed by larvae of borer and insecticidal activity was observed. Only positive cultures were selected for future studies [4].

Media to study colony morphology and phenotypic characteristic: Nutrient agar media was used. The selected strains were subcultured on Nutrient agar plated and their morphology was observed as shown in Table 1 and fig 1.

Biochemical Analysis
Motility test, Methyl red and Voges-proskaeur tests were performed following Olutiola *et al.*, 2000 [5] and Catalase test, Indole test and Oxidase tests were performed following Cheesbrough, M., 2006 [6].

Int.J.Curr.Microbiol.App.Sci (2017) *6*(10): 225-228

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 10 (2017) pp. 225-228**
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.610.028

Effect of Integrated Nutrient Management on Soil Properties, Yield Attributes and Yield of Wheat (*Triticum aestivum* L.)

Abhimanyu Yadav[1], Adesh Kumar[1*], Ved Prakash[1], Neeraj Kumar[1], Ashutosh Tiwari[2] and R.K. Yadav[3]

[1]Department of Soil Science and Agricultural Chemistry, [2]Department of Plant Biotechnology, [3]Department of Crop Physiology, N.D. University of Agriculture and Technology, Narendra Nagar (Kumarganj) Faizabad -224 229 (U.P.), India

**Corresponding author*

Keywords

Integrated Nutrient Management, Yield, Soil properties.

Article Info

Accepted:
04 September 2017
Available Online:
10 October 2017

A B S T R A C T

A field experiment was conducted during winter season of 2014-15 on wheat at Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (UP). The soil of the experimental field was silt loam having pH 8.25, EC 0.35 dSm^{-1}, organic carbon 4.4 g Kg^{-1} available nitrogen 195 Kg ha^{-1}, available P 12 Kg ha^{-1} and available K 240 Kg^{-1} he experiment was consisted of 8 treatments *viz.* T_1 (control), T_2 (100 % RDF), T_3 (75 % RDF), T_4 (75 % RDF + 25 % N-FYM), T_5 (75% RDF + *Azotobacter*), T_6 (50 % RDF + 50 % N-FYM) T_7 (50 % RDF + 50 %N-FYM + PSB) and T_8 (50 % RDF + *Azotobacter* + PSB) were laid in the randomized block design with three replication. The highest values of yield and yield attributes were recorded with treatment T_7 (50% RDF + 50% N- FYM + PSB) which was significantly superior over control as well as T_3 (75% RDF), T_5 (75% RDF + *Azotobacter*) and T_8 (50% RDF + *Azotobacter* + PSB) and statistically at par with rest of the treatments.

Introduction

Wheat (*Triticum aestivum* L.) is one of the most important cereal crops of the world. Among the world's most important food grains, it ranks next to rice. It is eaten in various forms by more than one billion in the world. Millions of farmer in developing countries need adequate resource for augmenting crop productivity and sustainability of soil. Therefore to maintain fertility and productivity of soil at sustainable level for long duration, there is need to adopt the concept of integrated nutrient management. Organic manure such as farm yard manure, vermin-compost, crop residues, biofertilizer, green manure and chemical fertilizer are considered to be an integral component of integrated nutrient management and may help to recover soil health in cropping system. As they improve soil fertility and physical properties such as soil structure, aeration, porosity, infiltration rate and water holding capacity and decrease soil crusting, organic matter in soil improve physical condition of the soil for better performance of micro-organism and physical status of soil. Organic matter affects crop

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 8 [3] February 2019 : 91-95
©2019 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

ORIGINAL ARTICLE **OPEN ACCESS**

Effect of drought stress at reproductive stage of rice (*Oryza sativa* L.) genotypes.

Shambhoo Prasad[1]*, Ajay Kumar[1], Ashish Kumar[2], Vishwas Mishra[1], Krishna Kumar, Rakesh Dwivedi[1], Adesh Kumar[1] Chhathi Ram[2], Rohit Nandan[2],M. P. Singh[2] and D. K. Dwivedi[1]
[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
[2]Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India.

ABSTRACT

A pot experiment was conducted with five rice genotypes to evaluate rice genotype at reproductive stage drought stress. Rice genotypes were exposed to 15 days drought at reproductive stage by receding the water. The leaf rolling, relative water content (RWC) leaf, total chlorophyll content (SPAD) and leaf proline content were recorded at the end of drought. Less leaf rolling and less reduction in RWC and SPAD value and high proline content were recorded in Nagina 22 over other genotypes. Swarna sub1 was the most susceptible rice genotype as it showed high leaf rolling and more reduction in RWC and SPAD value and less accumulation in proline content.
Key word: *Drought, Genotypes, Stress and Yield*

Received 11.12.2018 Revised 04.01.2019 Accepted 11.01.2019

INTRODUCTION

Drought is one of the important abiotic stresses that severely effects on growth, development, and metabolism renfed areas [7]. Drought is an abiotic stress which affects plants at various levels and stages of their life period. But drought stress at reproductive stage is more serious than any other stage. The drought stress not only affects plant–water relations through the reduction of water content, turgor, and total water, but it also affects stomatal closure, limits gas exchange, reduces transpiration, and disturbs photosynthesis and ultimately yield of the plant [17]. A low water potential effect of on mineral nutrition and plant metabolism which decrease the leaf area and alter assimilates partitioning among the plant organs [15, 19].

Rice varieties have differential responses to abiotic stresses because of the complexity of interactions between stress factors and various molecular, biochemical, and physiological processes that affect plant growth and development [20, 21]. Drought stress affects the growth behavior and yield and yield components irrespective rice genotypes [20]. Drought stress due to water deficit is a common-constraint in upland cultivation systems of plants [9, 10]. Drought stress reduces the rice growth and severely affects different traits, such as seedling biomass, stomatal conductance, photosynthesis, starch metabolism, and plant–water relations [12, 14, 16, 18]. Rice genotypes have differential response to water deficit 6]. Grain yield of some rice varieties was reduced by up to 81 % under drought condition and this reduction depended on timing, duration, and severity of the plant water stress [14, 18]. When rice genotyped exposed to water deficit; panicle length and fertile grains in two tolerant varieties were not significantly decreased, leading to greater productivity than in two sensitive cultivars.

MATERIALS AND METHODS

Five rice genotypes Nagina 22, Swarna sub1, NDR 97, Sushk Samrat and NDR 9830102 were selected to give heat treatment at reproductive stage. Rice genotypes were sown in pot condition two sets with five replication as per CRD design. All the standard cultural practices were followed as per norms during the crop growth. Drought treatment was given for 15 days at reproductive stage by receding the water. Leaf rolling (IIRI Scale), RWC (Slatyer, 1967), total chlorophyll content (chlorophyll meter) and proline

Int.J.Curr.Microbiol.App.Sci (2020) 9(7): 1851-1855

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 7 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.907.213

Assessment of Antagonistic Activity in PGPR Isolates against *Alternaria solani* causing Early Blight of Potato

Ashutosh Tiwari[1], Adesh Kumar[1*], Minakshi[1], Shambhoo Prasad[1], D. K. Dwivedi[1], N. A. Khan[1], Arun Kumar[2], Ved Prakash[3], Jaipal[4], Sushil Kumar Singh[5], Pankaj Kumar[6] and Abhimanyu Yadav[7]

[1]*Department of Plant molecular Biology and Genetic Engineering, ANDUAT Kumarganj, Ayodhya -224229, India*
[2]*PBR Agriculture college, Gausganj, Hardoi, India*
[3]*Department of Soil Science, ANDUAT, Kumarganj, Ayodhya -224229*
[4]*UPCAR, Lucknow, India*
[5]*Department of Plant Pathology, ANDUAT Kumarganj, Ayodhya -224229, India*
[6]*Directorate of Extension, ANDUAT Kumarganj, Ayodhya -224229, India*
[7]*Department of Soil Science & Agril Chemistry, P G. College Ghazipur U.P India*

**Corresponding author*

Keywords
Antagonistic Activity, Alternaria solani Early Blight of Potato

Article Info
Accepted: 17 June 2020
Available Online: 10 July 2020

A B S T R A C T

In the present study, the fungus was isolated from infected leaf of potato and identified as *Alternaria solani*. Twenty four bacterial strains isolated from potato rhizosphere on PDA media. The screening of all 24 potato rhizosphere isolates for IAA, phosphate solubilization, Insecticide tolerance, salt tolerance, antibiotic sensitivity and ammonia production was performed. Out of these isolates, only four isolates (5, 15, 16 and 23) showed high inhibitory effect on the pathogenic fungus in dual culture. PGPR isolate no 5 showed highest 95% inhibition against *Alternaria solani*.

Introduction

Potato (*Solanum tuberosum* L.) is one of the world's most important food crops, and is grown in more than 100 countries with different climate conditions including temperate, subtropical and tropical zones. There are several diseases in potato caused by fungi, bacteria, viruses, nematodes and abiotic factors. Among which an early blight caused by *Alternaria solani* has been known to cause yield losses up to 80% (Martin, 1986). The disease manifests as leaf spots with dark brown to black concentric ring which later enlarge and result in blighting of leaves and fruits. The dark spot and sunken lesions also

Int.J.Curr.Microbiol.App.Sci (2017) *6*(10): 1319-1322

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 10 (2017) pp. 1319-1322**
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.610.155

Integrated Management of Lentil Wilt Caused by *Fusarium oxysporum* f. sp. *lentis*

Sushil Kumar Singh[1], Adesh Kumar[2*], Bhanu Pratap Singh[1], Jay Kumar Yadav[1] and Khushboo Dubey[1]

[1]Department of Plant Pathology, N. D. University of Agriculture and Technology, Kumarganj, Faizabad 224229, U.P., India
[2]Plant Molecular Biology and Genetic Engineering, N. D. University of Agriculture and Technology, Kumarganj, Faizabad 224229, U.P., India
**Corresponding author*

Keywords

Lentil, Wilt, Integrated, Management, *Fusarium oxysporum* f. sp. *lentis*, Bio-agent, Chemical.

Article Info

Accepted:
14 September 2017
Available Online:
10 October 2017

ABSTRACT

Field experiments were conducted in Faizabad during 2014-15 and 2015-16 cropping season to evaluate the effect of different control options (seed treatment with Carbendazim, *Trichoderma harzianum* and intercropping with linseed, alone and in combination) on lentil wilt caused by *Fusarium oxysporum* f. sp. *lentis*. The results indicated that seed treatment with *Trichoderma harzianum* (4g/kg seed) + Carbendazim (1g/kg seed) + intercropping with linseed (2:1 ratio) found minimum wilt incidence (11.67%), maximum disease control (72.06%) and higher yield (1291 kg/h) as compared to check having maximum wilt incidence (41.78%) and lowest yield (597 kg/h).

Introduction

Lentil (*Lens culinaris* Medik.) is one of the major grain legume crops and play very important role in the supply of the protein to under nourished vegetarian population of the country. It is mainly grown in North-Eastern plain zone as sole and intercrop under rain-fed conditions. It suffers from a number of diseases. Wilt of lentil caused by *Fusarium oxysporum f. sp. lentis* is one of the most wide spread and destructive disease where ever crop is grown. The yield losses due to this disease as much as 50 percent have been reported in India (Anonymous, 1999).

Many attempts have been made to control this disease using chemical, biological, varietal and cultural methods (Ram and Pandey, 2011; Sinha and Sinha, 2004; Khan and Mehnaz, 2003; Srivastava *et al*., 2000).

None of the control measures found to be effective individually at field level. Seed treatment with fungicide and bioagents is most commonly used methods and intercrop is often used in integrated management. However, the present investigation deals with the integrated management of lentil wilt by

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1350-1357

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1350-1357
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation of Wheat (*Triticum aestivum* L.) Lines at Reproductive Stage for Heat Stress Tolerance

Bandana Jaiswal[1], Shambhoo Prasad[1]*, Reena Rani[1], Sonam Singh[1], Ashish Kumar[1], Adesh Kumar[1] and R.K. Yadav[2]

[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
[2]Department of Crop Physiology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
**Corresponding author*

A B S T R A C T

Keywords

Chlorophyll, Stay green duration, Wheat, Heat stress, Yield components

An experiment was carried out during rabi season (2016-17) at the Student Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad-224229 (U.P.), India. Five wheat lines NWL-10-14, NWL-12-13, KO-307, NWL-12-2, and NWL-12-4 were exposed to heat stress by delay sowing of forty days from normal date 15 November so that wheat lines could experienced severe heat stress at grain filling stage. The screening of wheat genotypes was done on the basis of plant height, tiller number per plant, stay green duration, number of grain per spike, test weight and yield plant^{-1}. The heat stress at time of grain filling reduced grain yield and its components irrespective of wheat lines. Among the five wheat genotypes KO-307(12.72%), NWL-12-13(14.92%) showed tolerant on the basis of stability in chlorophyll content and stay green duration.

Introduction

Wheat (*Triticum aestivum* L.), a member of family Poaceae is one of the leading cereals of many countries of the world including India. Being most important food crop of India, it is a main source of protein and energy. In India, wheat is the second most important food crop after rice both in terms of area and production. The northern and western part of India has maximum area and production under wheat cultivation.In India, Uttar Pradesh, Punjab and Haryana are the three major wheat producing states. As a C3 plant wheat is capable of growing in cool environments. Optimal growth of wheat occurs at an average temperature of 25°C, with minimums at times as low as 3°C to 4°C and maximums of 30°C to 32°C.(Curtis *et al.*, 2002).

Abiotic stress factors such as heat, cold, drought, salinity, and nutrient stress have a huge impact on world agriculture, and it has been suggested that they reduce average yields by >50% for most major crop plants (Wang *et al.*, 2003). Heat stress is an important constraint to wheat productivity affecting different growth stages specially anthesis and grain filling. Heat stress may be defined as "the rise in temperature beyond a threshold level for a period of time sufficient to cause irreversible damage to plant growth and development. It has already been

Int.J.Curr.Microbiol.App.Sci (2017) *6*(12): 3828-3832

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 12 (2017) pp. 3828-3832**
Journal homepage: http://www.ijcmas.com

EXCELLENT PUBLISHERS

Short Communications

https://doi.org/10.20546/ijcmas.2017.612.441

Short Presentation of the Studies on Microbial Metabolites as Eco Friendly Insecticides against *Halicoverpa armigera*

Divya Srivastava[1*], Adesh Kumar[1], Poonam C. Singh[2], Suchi Srivastava[2], Shalini Srivastava[1], Ashutosh Tiwari[1], Praveen Tiwari[1], Bhawna Mathur[1], Jasvant Singh[1] and Arun Kumar[1]

[1]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Faizabad, U.P., India
[2]Division of Plant Molecular Interaction, C.S.I.R-National Botanical Research Institute-CSIR, Lucknow, U.P., India
**Corresponding author*

Keywords

Biopesticide, Pod borer, *Halicoverpa armigera*, Microbial biocontrol of insect, Chemical pesticide

Article Info

Accepted:
28 October 2017
Available Online:
10 December 2017

A B S T R A C T

Today crop pests have become a major concern for the farmers across the world. *Helicoverpa armigera* commonly known as Gram Pod-Borer is an economic important insect pest of gram crop, which was used to be treated with chemical insecticides. Due to misuse and overuse of these chemical insecticides, resistance is being developed in many insects resulting in increased survival rate of the insect pests. There is an urgent need for alternatives of these chemical insecticides. Bio-insecticides are eco-friendly insect/pest control which is obtained from naturally occurring substances (biochemicals), microbes and plants. Before developing a new insecticide, the scenario of *H. armigera* and its bio-control should be presented with the help of some prior studies. This paper describes the national and international research work based on the microbial pesticide/ insecticides against *H. armigera*.

Introduction

Agriculture is the backbone of Indian economy which has gone through immense changes in the second half of the twentieth century. Adoption of technologies, high yielding varieties, and agrochemicals between 1960 to 2000 lead to 'The Green Revolution' increasing the crop yield per hectare. Today crop pests have become a major concern for the farmers across the world. *Helicoverpa armigera* is commonly known as Gram Pod-Borer.

Productivity of Gram crop is strongly affected by *H. armigera*, which damages 90-95% crop during favorable weather conditions, due to its high fecundity, migratory and polyphagus nature, and its resistance to insecticides. Yield losses of 400 kg/ha caused by the Pod-borer have been reported, with damage to pods ranging from 30-40% to 90-95% (Dhaliwal *et al.*, 2010). Economic damage is the greatest in cotton and vegetables.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(1): 479-483
Received: 12-11-2017
Accepted: 14-12-2017

Divya Srivastava
G. B. Pant Institute of Engineering & Technology, Pauri Garhwal, Uttharakhan, India

Mamta Baunthiyal
G. B. Pant Institute of Engineering & Technology, Pauri Garhwal, Uttharakhan, India

Adesh Kumar
Narendra Deva University of Agriculture and Technology, Faizabad, U.P. India

Kavita Yadav
Allahabad State University, U.P. India

Dheeraj Yadav
Narendra Deva University of Agriculture and Technology, Faizabad, U.P. India

Sharvan Kumar
Narendra Deva University of Agriculture and Technology, Faizabad, U.P. India

Correspondence
Divya Srivastava
G. B. Pant Institute of Engineering & Technology, Pauri Garhwal, Uttharakhan, India

Comparative study on the Effect of Different Lead Concentrations on Two varieties of *Triticum aestivum* L. (Wheat)

Divya Srivastava, Mamta Baunthiyal, Adesh Kumar, Kavita Yadav, Dheeraj Yadav and Sharvan Kumar

Abstract
Lead (Pb) is the most common heavy metal contaminant in the terrestrial and aquatic ecosystems. It enters the ecosystem through various natural and anthropogenic sources. Plants absorb Pb from their environment; but it is not an essential element. Wheat (*Triticum aestivum* L.) is a main link in tropic chain; and it is one of the economically important food crops. Wheat is also the main pathway for ingestion of the pollutant by humans and animals through food and feed. The present work discusses how Pb affects nutrient uptake and metabolism in wheat, Pb gets accumulated in a dose-dependent manner in wheat plant, and causes toxicity in the plant. A pot-culture experiment was conducted to study the effects of Pb (applied as lead acetate) on two wheat varieties: PBW-373and PBW-343. Lead was applied to wheat seedlings at 0, 2, 4 and 8 g/kg quantity of lead acetate mixed with soil. The shoot length was observed to be decreased slowly with increasing concentration and at the highest concentration of Pb, the root length was decreased by four times of control in both variety. It decreased the growth and yield of plant as well as different parameters of growth measurements. Both varieties PBW 373 and PBW 343 has a great capacity to accumulate lead which shows their tolerance against lead but PBW 373 has a higher capacity of accumulation as compared to PBW 343.

Keywords: Lead, Wheat, Source of lead, Mechanism of toxicity, pot experiment, lead accumulation

Introduction
Wheat (*Triticum aestivum* L.) is a staple food of overgrowing world population. Millions of tons of wheat are grown each year throughout the globe. Yield of wheat is low, due to different reasons such as drought, salinity, water logging, lack of balanced nutrition of the crop, infertile soils and contaminated soils with various contaminants including chemicals and heavy metals. The over use of natural resources and rapid industrialization in developing countries have further increased the contamination of agricultural soils with metals. Heavy metal contamination is harmful to wild life, humans and agricultural products produced. Selected heavy metals are essential micronutrients, for example, as they act as cofactors of key metabolic enzymes, but when their concentration becomes high in soil, they become more toxic to the plants. The sources of lead (Pb) indeed are from numerous daily used common products in diverse locations, some of them quite unexpected (Srivastava *et al*., 2015) [7]. Lead adsorption onto roots has been documented to occur in several plant species. Once adsorbed onto the rhizoderm roots surface, lead may enter the roots passively and follow translocating water streams. High level of lead is inhibitor for seed germination and different growth parameters of plants; it reduces germination by lowering the enzymatic activity and growth by slow the rate of cellular division and expansion. Various physiological processes such as water transport, photosynthesis, respiration, metabolism of carbohydrates are inhibited by lead.
This paper represents how the increasing concentration of lead alters the photosynthetic pigments of two different wheat varieties viz. PBW 373 and PBW 343 as a comparative study.

Material and Method
For the experiment seeds of two different varieties of *T. aestivum* viz. PBW 343 and PBW 373 were obtained from Krishi Vigyan Kendra, Dariyapur, Rae Bareli, Uttar Pradesh. The germinated seeds of these two varieties were grown in soilrite medium and their leaves were harvested after 45 days of germination. The various chemicals used in this study were of analytical grade and procured from HI-media. Lead acetate was used for lead source to the plants.
Formula: $Pb(C_2H_3O_2)_2$
Molecular mass: 325.29 g/mol

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; SP4: 228-231

Sadhna Singh
Associate Professor, Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Jyoti Tiwari
M.Sc. Schloar, Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Deepti Giri
Guest Teacher, Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ravindra Singh
ADR, Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Adesh Kumar
Asstt Prof., Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Sadhna Singh
Associate Professor, Department of Food Science and Nutrition, Directorate of Research,& Department of Microbiology, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

(Special Issue -4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 21-24 December, 2018)

Microbial analysis of selected fast foods popular among college students of rural and urban areas

Sadhna Singh, Jyoti Tiwari, Deepti Giri, Ravindra Singh and Adesh Kumar

Abstract
The present study was undertaken to assess the microbial quality of fast foods popular among college students. Faizabad district was purposively selected for the study. Two colleges namely Chandrabali Singh Urmila Mahavidyalaya, Shivnagar, Kumarganj, Faizabad from rural area and Saket P.G. College, from urban area Faizabad were selected for the study. A sample of 260 college students 130 each, were selected from two colleges. Information regarding age, sex, caste, family composition, education and economic status of the family and specific information regarding fast food choice, type of fast food liked, reason for consuming fast food, opinion of respondents about fast food etc. were gathered through self structured questionnaire. In this study the majority of respondents were belong to general category (33.84%). In case of their preference of fast foods majority of respondents in rural area like chaat (30.76%), samosa (29.23%), chole-bhature (18.46%), burger (30.0%) etc. On the other hand, in urban area the majority of respondents liked kachorie (23.84%) and samosa (22.30%) followed by chole-bhature (13.84) and burger (28.46%).The microbial analysis of fast foods explored showed that maximum colonies were found in chaat (6.01×10^5/gm) and burger (3.45×10^5/gm), whereas, in pastry (1.2×10^5/gm) and samosa (2.25×10^5/gm) lowest colony were observed. The reason behind this could be that in chat boiled chole is added which is boiled in the morning and is used as such tillate night which favours the growth of microbes, while in burger raw cut vegetable like tomato, cabbage, onion are added. These vegetables are cut in the bulk in the morning and used throughout the day and have greater chance for microbial growth. Whereas samosa are deep fried and pastry are kept in air conditionered show cases.

Keywords: Fast food, Self-structured questionnaire, fast food preferences, Microbial composition

Introduction
Fast foods are foods or beverages that are low in nutrient density and they provide calories primarily through fats or added sugars and have minimal amount of vitamins and minerals. In short they are energy dense foods poor in micronutrients. Regular and consistent consumption of such food over a long period of time may therefore, be deleterious to health. Foods like burger and cola are nutritionally only refined carbohydrate containing empty calorie and hardly any vitamins, minerals and proteins. But their sodium content is very high. Some may contain chemical, artificial colour, flavours and preservatives which are not good for health. (Vani, 2016) [8] There are many options for microorganisms to contaminate fast foods ie. If the food is prepared, processed, handled, and stored under unhygienic conditions. The microbiological quality of different fast foods of Jessore city was determined whether the samples are contaminated with coliforms or not. Among the fast food *Enterobacteriaceae*, *Klebsiella spp.* was the most prevalent bacteria found (Ahmed *et al.* 2014) [4]. Fast food is especially popular among adolescents, who visit fast food outlet twice per week. Several factors have contributed to this phenomenal increase in the intake of fast foods including – a greater number of working women, dual career families, more diverse schedule of family members, an aging population and an increasing number of one and two persons households. Fast food meet the needs of many people because they are quick,

VOL. SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF SALICYLIC ACID AND CYCOCEL ON BIOCHEMICAL AND PHENOLOGY CHANGE OF MUSTARD (*BRASSICA JUNCEA* L. CZERN&COSS)

R. K. Yadav[1], Pradip Kumar Saini[1], Aditya Singh[1], Vinaya Kumar Yaadav[2], R.N. Kewat[1] ,Adesh Kumar[1] and S. Prasad[1]
1Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224 229 (U.P.)
2Chandrashekhar Azad University of Agriculture and Technology, Kanpur-208 002 (U.P.)

Abstract

The investigation entitled "Effect of salicylic acid and cycocel on biochemical and phenology change of mustard(*Brassica juncea* L. Czern & Coss)"was conducted during *rabi* season, 2016-17 at the Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) in randomized block design with 7th treatments, three replications and variety Narendra rai (NDR-8501). Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm) , (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on biochemical and phenology parameters like Chlorophyll content, Oil content (%), Days to 50 % flowering. The maximum chlorophyll 'a' and 'b' content was observed in salicylic acid 200ppm followed salicylic acid 100ppm at 60 DAS and 80 DAS over the control and maximum oil content was recorded in salicylic acid 200ppm followed by salicylic acid 100ppm and lowest increase was recorded in cycocel 200ppm among all treatments & Maximum increase in number of flowers plant $^{-1}$ was observed with the treatment of salicylic acid 200ppm followed by salicylic acid 100ppm and lowest increase was recorded in control among ten treatments.

Keyword: Biochemical, phenology, salicylic acid, cycocel

Introduction

Oilseed crops play an important role in agricultural economy of India. Rapeseed-mustard is the third important oilseed crop in the world after soybean (*Glycine max*) and palm oil (*Elaeisguineensis*Jacq.). Mustard is an important *rabi*crop of Rajasthan, Gujarat, Madhya Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Assam. India is one of the largest rapeseed-mustard growing countryin the World, occupying the first position in area and third position in production after China and Canada. India occupies the second position in area after China and third position in production of rapeseed-mustard in the world after China and Canada. In India, it is the second most important edible oilseed crop after groundnut sharing 25-30 percent Indian oilseed economy. The share of oilseeds is 14.1 % out of the total cropped area, in India, rapeseed-mustard accounts for 3% of it. Mustard seed is the second largest produced oilseed in the world with an area of 37.0 m ha, with the production of 63.09 m tones and productivity of 11.90 q ha^{-1}. India contributes 28.3 % and 19.8 % in world acreage and production. India produced around 7.4 mt of rapeseed-mustard next to China (11-12 mt) and EU (10-13 mt) with significant contribution in world rapeseed industry. Among the entire oilseed crops producing states in India, in U.P. the area under cultivation was 6.39 lakh ha with production of 7.9 lakh metric tonnes and productivity of 12.36 q ha^{-1} (Anonymous,2015).In India, mustard is mostly cultivated for use as edible oil. It is used as condiments and spices to improve the flavour of pickles and also as fodder for livestock. There is an increasing interest in crop as source of erucic acid for chemical industry. Rapeseed and mustard cake is used as a protein supplement in livestock and poultry feed. The cake has minerals like, S, P, Co, K, Mg, Zn and vitamins like niacin, thiamine, riboflavin, and vitamin E. The Indian mustard possesses oil content ranging from 31-48 per cent in air dried seeds. PGRs are extremely important agent and play an important role from germination up to senescence of the plant. Plant growth regulators (PGRs) can play an important role in increasing its yield by making the plants photosynthetically more effective. Use of growth regulators increased. Salicylic acid is ortho-hydroxyl benzoic acid and is a secondary metabolite acting as analogous of growth regulating substances. It helps in protection of nucleic acids and prevention of protein degradation. The salicylic acid is also known to induce many genes coding for parthenogenesis and proteins in response to biotic and abiotic stresses (Enyedi *et al*., 1992). Foliar application of salicylic acid increased the IAA content in broad bean leaves. Foliar application of salicylic acid exerted a significant effect on plant growth metabolism when applied at physiological concentrations, and thus acted as one of the plant growth regulating substances (Kalarani *et al*., 2001). Cycocel (2-Chloro ethyl three methyl ammonium chloride) is the most usual anionic plant growth, regulator. There are reports that anionic compounds treated plants were tolerant to drought conditions compared to untreated plants. Moreover, they had higher net photosynthesis potential. From a biochemical point of view, CCC prevents ent-kaurene synthesis in GA3 biosynthetic cycle leading to GA3 deficiency and the subsequent reduced vegetative growth reported that any yield increase by CCC was related to the enhanced dry matter accumulation. Cycocel foliar application increased cytokinin translocation from roots to shoots, leading to prolonged aboveground parts life-span and hence increased yield

Materials and Methods

The experimental site is situated at the student Instructional Farm of the university on the Ayodhya, Raibareli road, at a distance of 42 km from Faizabad city and 23 km away from Jagdishpur. In the present study, Variety Narendra rai (NDR-8501) Various concentrations of (T_1) Control, (T_2) Salicylic acid (50ppm), (T_3) Salicylic acid (100ppm), (T_4) Salicylic acid (200ppm) and (T_5) Cycocel (100ppm) , (T_6) Cycocel (150ppm), (T_7) Cycocel (200ppm). Observations were recorded at 30, 60, 90 DAS and at maturity. The observations were taken on growth parameters like Chlorophyll content, Oil content (%), Days to 50 % flowering.

Results and Discussion

Biochemical:

Chlorophyll content

The data presented in Table 1. clearly indicate that the foliar application of plant growth regulators improved the chlorophyll contents in leaf up to 60 DAS and after 60 DAS the decline trend was recorded in chlorophyll content. The maximum increase in chlorophyll content was registered in T_4 (salicylic acid @ 200ppm) at 40 DAS (2.31), 60 DAS (2.97), 80 DAS (1.98) followed by T_3(salicylic acid @ 100ppm) at 40 DAS (2.24), 60 DAS (2.88),80 DAS (1.92) and minimum increase in T_7 (cycocel @200ppm) at 40 DAS (1.95), 60 DAS (2.51), 80 DAS (1.67) and over control at 40 DAS (1.89), 60 DAS (2.43),and 80 DAS (1.62). Bekheta 2004 and Bekheta *et al*., 2006.

Table-1: Effect of salicylic acid and cycocel on chlorophyll of mustard at different growth stages

Treatments	Chlorophyll (SPAD value)		
	40 DAS	60 DAS	80 DAS
T_1 : Control	1.89	2.43	1.62
T_2 : Salicylic acid (50ppm)	2.01	2.59	1.72
T_3 : Salicylic acid (100ppm)	2.24	2.88	1.92
T_4 : Salicylic acid (200ppm)	2.31	2.97	1.98
T_5 : Cycocel (100ppm)	2.16	2.78	1.85
T_6 : Cycocel (150ppm)	2.12	2.72	1.81
T_7 : Cycocel (200ppm)	1.95	2.51	1.67
SEm±	0.05	0.06	0.04
CD at 5%	0.15	0.19	0.13

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue [3] 2017: 457-461
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE **OPEN ACCESS**

Bioavailability of iron, zinc, protein, carbohydrate and phytic acid in selected rice varieties of northern India and their scopes for molecular breeding

Arun Kumar, S. K. Z. Rizvi , Poonam, Deepak Kumar, Adesh kumar and K.N. Singh
Department of PMB & GE, N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U.P.) India
Corresponding author's e-mails: arunfaizabad@gmail.com

ABSTRACT
The lack of micronutrients such as Fe and Zn in staple food crops is a widespread nutrition and health problem in developing countries. Mineral bioavailability in rice could be improved by the selection of varieties with high Fe and Zn, as well as low phyticacid (PA) content. Therefore, present study was undertaken to investigate the variations of Fe, Zn and PA content in some popular high yielding local varieties. The study also investigated the effect of morphology of rice kernels on these parameters. For this purpose, we selected six varieties (Sarjoo-52, Madhukar, NDR-359, CSR-13, Swarna Sub-1 and Swarna varieties) The highest amount of phytic acid content was found in Swarna (9.12 g/kg) and lowest in Sarjoo-52 (5.61g/k). The highest iron content was found in Sarjoo-52 (24.15 ppm) and lowest in Swarna (12.48 ppm). The zinc content varied greatly from rice to rice. The highest zinc content was found in Sarjoo-52 (35.50 ppm) and lowest in CSR-13 (25.86 ppm). The highest protein was found in Swarna (8.78 %) and lowest in Madhukar (7.47 %). Highest carbohydrate content was found in Madhukar (74.43 g/100g) and lowest in Swarna (70.07 g/100g).
Keywords: Phytic acid, Iron, Zinc, Protein, Carbohydrates.

Received 30.07.2017 Revised 07.08.2017 Accepted 27.08. 2017

INTRODUCTION

Rice (*Oryza sativa L.*) which belongs to the family of grasses, Poaceae, is the main food source for more than two-third of the world's population (Sasaki and Burr, 2000), especially in Southeast Asia (Nwugo and Huerta, 2011; Wang *et al.*, 2011). It contains approximately 6-12% protein, 70-80% carbohydrate, 1.2-2.0% mineral matter and significant content of fats and vitamins (Khush*et al.*, 1997). It supplies 23% of global human/ capita energy and it fulfils 16% of per capita protein requirements. Rice has a relatively low protein contents but could be raised. Rice seed storage proteins are generally divided into water-soluble albumins, salt-soluble globulins, alcohol-soluble prolamines, and alkali or acid soluble glutelins. In rice grains glutelin is the major protein of the starchy endosperm and accounting for 60% to 80% of total seed protein (Kawakatsu *et al.* 2008). It is essential that these values must increase to up lift nutritional quality.

Rice is also the major source of intake of micro-nutrients such as zinc, iron, calcium, selenium and vitamins for Indian people specially those who live in the urban countryside (Doesthale*et al.*, 1979). Iron (Fe) is necessary for oxygen transport in the blood that iron is the central atom of the heme group, a metal complex that binds molecular oxygen (O_2) in the lungs and carries it to all of the other cells in the body (*e.g.*, the muscles) that need oxygen to perform their activities (Casiday and Frey, 2000). Like Iron, the micronutrient zinc is essential for all organisms (Andreini*et al.* 2006; Broadley*et al.*2007). Zn deficiency in humans is widespread and is estimated to affect more than 25 % of the world's population (Maret and Sandstead 2006). For Increasing these content including protein in local high yielding variety for this it is important that know their basic content.

Carbohydrates are the most prevalent source of food energy in the world. They play a major role in human diet, comprising about 40-75% of energy intake. In rice carbohydrate content have been reported approximately 87 % in grain (Devindra and Longvah2011). Our aim is to see its status in local varieties and how it is comparable in terms of other nutrients.

RESEARCH ARTICLE

ISOLATION AND EVALUATION OF ANTAGONISTIC PLANT GROWTH PROMOTING RHIZOSPHERIC BACTERIA FROM CHICKPEA

Km. Komal, Adesh Kumar, Niyaj Ahamad* and Shambhoo Prasad

Department of Plant Molecular Biology & Genetic Engineering, ANDUAT, Kumarganj Ayodhya (U.P), 224229, India
Email: komalkataria36595@gmail.com

Received-08.02.2022, Revised-19.02.2022, Accepted-07.03.2022

Abstract: Chickpea is an economically most important significant crop. Plant growth-promoting bacteria have been proved as potential tools not only for improving plant growth and development but also to protect host plants from stress conditions and pathogens. The present research is aimed to isolate bacteria from the rhizosphere of chickpea and to evaluate their antagonistic activity against *Fusarium oxysporum* and Plant growth promoting properties. A total of twenty one bacteria were isolated from four sampling sites. Out of which seventeen have displayed antagonistic activity against the pathogen of chickpea wilt. Among these seventeen isolates, elevenwere able to produce ammonia production, nine were able to produce Indole-3- acetic acid in tryptophan-supplemented medium, fourteen were able to solubilize inorganic phosphate in vitro and seven were able tosolubilize zinc.

Keywords: PGPR, Chickpea, PGP traits, *Fusarium oxysporum*

INTRODUCTION

Chickpea (*Cicer arietinum* L.) is the world's fourth most significant legume crop, accounting for 3.1 percent of global grain legume production. Gram, is a nutritious addition to a cereal diet in developing nations, and it is primarily planted for its highly proteinated edible seeds, which can be processed for seed and fodder production (Yadav *et al.*, 2011).

The continuously increasing population of the globe escalating the demand for pulses while decreasing the agricultural area at the same time. To meet the global demand, the application of chemical fertilizers in the agro-lands has become a common practice. On the other hand, the development of fungal diseases in leguminous crops substantially contributes to decreasing the pulses yield. Though the use of fungicides can manage the disease, their application is harmful to the ecosystem and the viability and survival of beneficial microbes (Heckel, 2012). Furthermore, the rising expense of pesticides and chemical fertilizers, as well as customer demand for pesticide free food, has prompted a search for cost effective and environmentally friendly alternatives.

Soil microbes are critical factors of soil fertility and health and play an important role in nutrient recycling. There is a group of special soil micro organisms which develop a close interaction with plant roots, colonize in the rhizosphere, and assist the plants by stimulating growth and suppressing diseases, which are known as plant growth-promoting rhizobacteria (PGPR) (Kloepper, 1978). PGPRs could establish a symbiotic, associative, or neutral association with plants and substantially affect crop growth and development. Currently, the PGPRs is considered as a unique and promising technique Currently, the PGPRs is considered as a unique and promising technique for delivering significant agricultural advantages (Niranjan *et al.*, 2005) as these microbes can promote plant growth either directly or indirectly at different stages of plant life (Gamalero and Glick, 2012). Direct growth promotion includes mobilization of nutrients like nitrogen fixation (Malik *et al.*, 1997), phosphate solubilization (Alori *et al.*, 2017), or enhancement of minerals availability (Korir *et al.*, 2017). Furthermore, other beneficial effects could also be posed by PGPRs like phytohormone production (Egamberdieva *et al.*, 2017), osmotic adjustment, stomatal regulation, modification of root morphology, *etc.* under abiotic stress conditions (El-Esawi*et al.*, 2018). On the other hand, the indirect growth promotion of PGPR is linked to their biocontrol ability. They can produce antagonistic chemicals such as phenazine, diacetylphloroglucinol (DAPG), hydrogen cyanide (HCN), 2–3 butanediol, acetoin, which help to protect plants from phytopathogens (Compant*et al.*, 2005). Several previous studies have employed PGPR as a biocontrol tool for suppression of plant diseases and also as inducers of disease resistance in plants (Bais *et al.*, 2004). Bacterial strains belonging to genus *Pseudomonas*, *Azotobacter* and *Bacillus* have been successfully used as PGPR to suppress plant diseases and improve plant growth (El-Sayed *et al.*, 2014).

Thus, the identification and characterization of PGPR populations indigenous to leguminous rhizospheres are therefore critical to the discovery of strains that can be utilized to improve growth and have the potential to suppress fungal diseases of legumes. The objectives of the present study were to isolate bacterial strains from the chickpea rhizosphere, to characterize these isolates on the basis of morphology and determination of PGPR properties along with antifungal activity.

*Corresponding Author

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3106-3113

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7** pp. 3106-3113
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Variable Lead Concentrations on Biochemical Properties of Two Varieties of *Triticum aestivum* L. (Wheat): A Comparative Study

Divya Srivastava[1*], Mamta Baunthiyal[1], Adesh Kumar[2], Shambhoo Prashad[2], Sanghmitra[2] and Sonam Singh[2]

[1]Department of Biotechnology, G. B. Pant Institute of Engineering & Technology, Pauri Garhwal, Uttharakhand, India
[2]Department of Plant Molecular Biology and Genetic Engineering, Narendra Deva University of Agriculture and Technology, Faizabad, U.P., India
**Corresponding author*

Keywords

Lead stress, Biochemical analysis, wheat, lead effect on wheat, abiotic stress, and lead stress tolerance

A B S T R A C T

A pot-culture experiment was conducted to study the effects of lead (Pb) (applied as lead acetate) on two varieties of *Triticum aestivum* L. (Wheat): PBW-373 and PBW-343. Lead was applied to wheat seedlings at 0, 2, 4 and 8 g/kg quantity of lead acetate mixed with soil. Lead also showed deleterious effects on the production of photosynthetic pigments, carbohydrates; soluble protein in all variants but Pb toxicity increased the Proline accumulation in leaves of plants as the result of lead toxicity to plants. This work represents the effect of variable lead concentrations on biochemical properties of two wheat varieties and we could conclude that PBW 343 got more toxicity as compared to PBW 373 hence it has the tolerance capacity.

Introduction

Biotic stress includes the damage caused by different life forms e.g. pathogens like virus, bacteria, fungi etc., and insects and pests. Abiotic stress refers to the impact of environmental factors like climatic factors, edaphic factors, environmental pollution etc. Heavy metals and salinity in the environment are on the increase, affecting crop productivity. Lead is known to cause a broad range of toxic effects in living organism, including those that are morphological, physiological, and biochemical in origin (Srivastava, *et al.*, 2015). Ratlam (Madhya Pradesh), Bandalamottu Mines (Andhra Pradesh), Vadodara (Gujarat) and Kobra (Chhattisgarh) these are four site of lead in India. These places are highly contaminated with lead so cannot be used for farming as lead is highly toxic heavy metal; only lead tolerant crops can be grown at these places.

With this work we tried to find out if wheat can tolerate the lead concentration and can be grown in lead contaminated soil. To study this, we performed a pot experiment and give different lead concentration to two randomly selected wheat varieties PBW 343 and PBW 373 followed by different biochemical analysis.

Indian Journal of Agricultural Sciences 92 (2): 236–9, February 2022/Article

Determinants of behavioural indicators of potato (*Solanum tuberosum*) growers in Kannauj district of Uttar Pradesh

ASHWANI KUMAR VERMA[1], R K DOHAREY[2], S K DUBEY[3]*, O P SINGH[4] and S N SINGH[2]

ICAR-Agricultural Technology Application Research Institute, Kanpur, Uttar Pradesh 208 002, India

Received: 07 July 2020; Accepted: 31 August 2021

ABSTRACT

The present study was carried out to find out the factors that may affect the behavioural dimensions of potato farmers, viz. their knowledge and adoption level as well as their knowledge-adoption gap about scientific potato cultivation practices in Kannauj district of Uttar Pradesh during 2016–17. Multiple regression and stepwise regression analysis was done with selected independent variables to see the effect of independent variables on the selected indicators. The analysed data showed that at knowledge level out of 18 variables taken for analysis of regression, four variables, viz. housing pattern, occupation, material possession and formal extension contact were highly significant (P<0.01); five variables, viz. education, housing pattern, informal extension contact, scientific orientation and risk orientation were highly significant (P<0.01) for their adoption level; and at knowledge-adoption gap one variable i.e. education was highly significant (P<0.01). The R^2 value and F value of knowledge, adoption and knowledge adoption level were 0.59, 0.29, 0.33 and 8.63, 2.52 and 2.95 (P<0.01), respectively. The R^2 value of stepwise regression in knowledge, adoption and knowledge-adoption gap level was 0.54, 0.24 and 0.24.

Keywords: Adoption, Knowledge, Multiple regression, Potato

Potato (*Solanum tuberosum* L.) belongs to family Solanaceae, is well known as the king of vegetables and has emerged as the most important food crop of India. Despite higher retail price of potato, the sowing of tuber is set to shrink in Northern states as farmers prefer alternate crops including onion, garlic, sugarcane and other perishables during *rabi*. Introduction of potato crop is not only important for ensuring socio-economic upliftment of the local farmers but for warranting financial sustainability of crop husbandry also (Rana *et al.* 2017). In last few years, the gap between wholesale and retail price of potato has widened by two-three times. It has disappointed potato growers and many are shifting to other crops. Mostly big farmers who store their produce have incurred losses in potato business and many such farmers are shifting from cultivation of tuber. In the last three years, glut in potato production has caused unrest among farmers in North. The annual output has grown to 53 million tonnes (MT) in 2018–19 compared to 51 million tonnes in 2017–18 (Krar 2019). The increase in area of potato cultivation has squeezed margins for growers as well as traders in the region.

[1]C.S.A. University, Kanpur, Uttar Pradesh; [2]N D University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh; [3]ICAR-ATARI, Zone III, Kanpur; [4]ICAR-Indian Agricultural Research Institute, New Delhi. *Corresponding author email: skumar710@gmail.com

Uttar Pradesh is a major potato growing state in India followed by West Bengal and Bihar with the production of 10455.30, 7482.30 and 1720.20 thousand tonnes, respectively. It produced almost 13.1 MT of potato, thus contributing nearly 28.6% of total potato production in the country (Directorate of Economics and Statistics 2016). Kannauj district is the highest producer of potato followed by Farrukhabad and Agra with production of 9.43, 8.33 and 6.47 lakh metric tonnes with area being 34.6, 29.8 and 18.20 thousand hectares, respectively (Anonymous 2001–02). Therefore, considering the significance of potato in Kannauj district, the study was carried out to analyse the profile of potato farmers of the district and to identify the determinants which may affect their behavioural dimensions in terms of their level of knowledge, adoption and knowledge-adoption gap.

MATERIALS AND METHODS

The present study was carried out in Kannauj district of Uttar Pradesh during 2016–17, which was selected purposively due to its high grown area under potato crop. It is considered to be the most climatically suitable area for potato cultivation. Jalalabad block of Kannauj district with maximum area under potato cultivation was further selected purposively. Five villages, viz. Paraspur, Gadnapur, Mirpur, Purva, and Bisundhua were selected randomly and from each village, 25 farmers actively involved in cultivating potato were further selected randomly.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(6): 502-505
Received: 15-09-2020
Accepted: 21-10-2020

Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Prakash Singh
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Singh
SMS/Scientist, Department of Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi, Peppeganj, Gorakhpur, Uttar Pradesh, India

Rishi Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhay Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Pandey
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Factors influencing adoption level of farmers regarding organic farming in eastern UP

Arvind Pratap Singh, Prakash Singh, RK Doharey, RK Singh, Rishi Kumar Singh, Abhay Kumar Singh and Vikash Pandey

Abstract
This study was undertaken in three districts selected randomly from each Zone namely (1) North Eastern Plains Zone (2) Eastern Plains Zone (3) Vindhyan Zone in Eastern Uttar Pradesh. From each selected district, two blocks were selected randomly. Thereafter two villages from each block was selected randomly, thus make a total 12 villages. The majority of respondents were of middle aged and literate including formal and informal education. Highest number of the respondents (55.83%) was observed in the medium category (33 to 44) of materials possession. Majority of farmers (60.41%) had medium level of overall extent of awareness about organic farming practices. The variables like age, family size, material possession and economic motivation, were found positively correlated but not significant with adoption level regarding organic farming practices. The variables like education, caste, family type, housing pattern, land holding, occupation, income, social participation, extension contact, value orientation, risk orientation and attitude were found negatively correlated but not significant with adoption level regarding organic farming practices.

Keywords: block, proportionate, age, education, overall materials possession, organic farming practices, adoption, correlations etc

Introduction
The organic movement in India has its origin in the work of Howard who formulated and conceptualized most of the views which were later accepted by those people who became active in this movement. Organic farming is a production system which avoids, or largely excludes, the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives.

The Indian government has initiated various promotional activities, such as setting up a National Institute of Organic Farming in Ghaziabad, Uttar Pradesh, in 2003, appointment of accreditation and certifying agencies for organic farm products, developing norms for certifying organic products and providing financial support to implement promotional activities for organic farming. The task force constituted by the Government of India has also recommended the initiation of post-graduate level courses in organic farming. One of steering committee constituted by Central Government under the chairmanship of Mr. M.S. Swaminathan, Chairman, farmer's commission, has suggested taking up organic farming as a challenging national task and to take up this as a trust area of the 10th Five Year Plan. The Ministry of Commerce launched the National Organic Program in April, 2002 and processed food products export.

"Organic farming is a production system that avoids or largely excludes the use of synthetically compounded fertilizer, pesticides, growth regulators and livestock feed additives. Organic farming systems rely to the maximum extent on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilt, to support plant nutrients and control insects, weeds and other pests". (Kanel, 2005) [2].

Methodology
The present study was conducted in six blocks of three districts namely Barabanki Basti, and Prayagraj of Uttar Pradesh. Each district selected two block and find out the different independent variables and their level of adoption of organic farming practices in organic farming. Those blocks namely Masauli, bani kodar, Haraiya, Vikram jot, Phulpur and Dhanupur was selected randomly having production area of agriculture.

Hence, the present study has been designed to explore the level of adoption of organic farming practices in Barabanki, Basti, and Prayagraj districts of Uttar Pradesh with specific objective.

Journal of Natural Resource and Development 16 (1) 150-160 2021 | NAAS RATING : 3.77 | ISSN-0974-5033

APPLICATION AND USE OF MOBILE PHONE FOR INDIAN AGRICULTURE SECTOR: A REVIEW PAPER

[1]Rishi Kumar Singh, [1]R. K. Doharey, [1]N. R. Meena, [1]Alok Kumar Singh,
[2]Adesh Kumar Verma, [3]Neeraj Kumar and [1]Vikas Pandey
[1]A.N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, (U.P.), India
[2] Kulbhaskar Ashram P.G. College, Praygraj, (U.P.), India
[3] Division of Les & IT ICAR- IVRI, Izatnagar, Bareilly, (U.P.), India

Received : 15.12.2020 Accepted : 21.01.2021

ABSTRACT

Agriculture is the most important sector of the Indian economy and is more or less a compulsion for the livelihood of millions of farmers. Many initiatives have been taken in this regard to utilize mobile phones by private sector (Indian Farmers Fertilizer Cooperative Limited, Nokia, Airtel, Tata Consultancy Services, etc.), public sector (Ministry of Agriculture and Farmers Welfare, Agricultural Universities, Research Institutions like Indian Council of Agricultural Research, State Governments). The Indian government and other development agencies promote farmers and their income generating projects as a way of encouraging growth through increased agricultural production. The impact of new technology to economic growth can only be realized when the use of these new technologies is widely diffused. Introduction of mobile phones and services in agriculture can be advantageous to farmers, traders and producers for improving their decision making.

Keywords : Agriculture, mobile phone, farmers, e-Mandi, Mandi Trades

INTRODUCTION

Indian economy is the most important aspect of the agricultural sector. Research, extension and farmer's efforts have all contributed significantly in increasing food production from 50 million tonnes in 1950-51 to a landmark achievement of an estimated 259.32 million tonnes in 2011-12 (MOA, GOI, 2013). Estimates indicated that 60 per cent of farmers do not access any source of information for advanced agricultural technologies resulting in a huge adoption gap (NSSO, 2005). Government, private, and general public agencies are often interested in the decisions made by the Indian farmers as they have large influences beyond the farm. Agriculture clearly remains one of the most important portfolios in

Biological Forum – An International Journal 13(2): 01-07(2021)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Review on Frontline Demonstration of KVK and its Effect on Yield, Economics, Income and Management Practices of Different Crops in India

Shesh Narain Singh[1], Manoj Kumar[2], *M. P. Gautam[3] and R. K. Doharey[4]

[1]SMS, Krishi Vigyan Kendra, Sohna, Siddharthnagar,
ANDUAT, Narendra Nagar, Ayodhya, India- 224229, (U.P.) India.
[2]Gest Faculty, Department of Extension Education,
Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India.
[3]Department of Entomology,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.) 250110, India.
[4]Professor, Department of Extension Education,
College of Agriculture, ANDUAT, Narendra Nagar, Ayodhya, (U.P.) 224229, India.

(Corresponding author: M. P. Gautam)*
(Received 12 March 2021, Accepted 25 May, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Field demonstration is the elderly concept of Front-Line Demonstration. FL developed by the Indian Council of Agriculture Research with the beginning of the Technology operation on Oilseed Crops during mid-eighties. Field demonstrations carry out close regulation of scientists of National Agriculture Research System recognized as frontline demonstrations because technologies are demonstrated in front of farmer by the scientists before being fed into the major extension method of the State Department of Agriculture. Adoption level of the beneficiaries were medium to high even as non-beneficiaries were found small level of adoption are enhanced production practice of mustard crop, proper training and extension strategies to be followed maximum adoption of mustard crop in the research area.

Keyword: Frontline Demonstration, KVK, Yield, economics, growth, management practices and India.

INTRODUCTION

The Krishi Vigyan Kendras were assigned different actions pertaining to evaluation, modification and expression of different novel technologies. This includes conduction of association of Frontline demonstration, estimation, training programmes and sophistication of different agriculture and related technologies during OFT. Extension activities and movement of Krishi Vigyan Kendras do significant movement for the farmers and useful in hole crop period. Krishi Vigyan Kendras are the base of all organizations who work for purpose of technology through refinement, evaluation and demonstration of confirmed technology under diverse "micro farming" situation in a region (Das, 2007). In the year 1991-92 Indian Government established a "Technology Mission on Pulses" to improve the pulse production and productivity through frontline demonstration. The mandate of the Krishi Vigyan Kendra (KVKs) are application of technology through refinement, demonstration and assessment of verified technologies under different "micro farming" situations in a region (Das, 2007).

Frontline demonstrations is show recently released crop protection and production technology and its running practice on the farmers field under diverse farming situation and agro-climatic regions. While demonstrating the technologies on farmer's field, the scientist are compulsory to study situation, factors and elements involving in higher crop production, Limitation of production and thereby create production data and feedback information. Frontline demonstrations were conduct in two adopted villages at pasture of 20 farmers within area of 0.4 hectare each. Moong crop was grown according to the package and practices of moong crop according field demonstration (Anonymous, 2017).

A. Additional activities to be conducted by KVKs

1. Field day
2. Kisan Mela
3. Kisan Gosthi
4. TV/Radio talk
5. Film Show
6. Farmers visit to KVKs
7. Diagnostic and Exposure Visits
8. Trainee and Ex-trainee meet
9. Commemoration of important day
10. Animal Health Camp
11. Trade fair
12. Kisan Mobile Sandesh

The Pharma Innovation Journal 2022; 11(3): 1957-1960
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 1957-1960
© 2022 TPI
www.thepharmajournal.com
Received: 03-01-2022
Accepted: 08-02-2022

Piyusha Singh
Department of Genetics and Plant Breeding, College of Agriculture, ANDUAT, Uttar Pradesh, India

Akanksha Tiwari
Department of Genetics and Plant Breeding, College of Agriculture, ANDUAT, Uttar Pradesh, India

Vimlesh Kumar
Department of Horticulture, College of Agriculture, ANDUAT, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, College of Agriculture, ANDUAT, Uttar Pradesh, India

Corresponding Author:
Piyusha Singh
Department of Genetics and Plant Breeding, College of Agriculture, ANDUAT, Uttar Pradesh, India

Genetics and epigenetics-role in development of climate resilient crops

Piyusha Singh, Akanksha Tiwari, Vimlesh Kumar and Alok Kumar Singh

Abstract
Today's era, Recent advancements in the area of -omics of crops have facilitated effect on plant response to environmental stresses and identification of epigenetic marks. As climate change effects the crop growth, so there is need to develop climate resilient crop variety. As germplasm plateu occur in many crops so there is need to examine genes from wild variety, which are high yielding and resistant to climate change. As global warming occur temperature fluctuation rate is very high. To better adapt genetics and epigenetics transiently or lastingly to stimuli from the surrounding environment, the chromatin states in plant cells vary to allow the cells to fine tune their transcriptional profiles. Conceptually genetics deals with gene function and genes whereas epigenetics deals with gene regulations. Modifications in chromatin states include a wide range of histone post-transcriptional modifications, histone variants, DNA methylation and non-coding RNAs, which can arrange various chromatin states that epigenetically determine specific transcriptional outputs. Specifically genetics focuses on how DNA sequences changes in the cell while epigenetics focuses on how DNA is regulated to achieve those changes. This has paved the way to exploitation of epigenetic variation in crop breeding. That helps to develop climate resilient crop varieties.

Keywords: Omics, genetics and epigenetics

Introduction
Epigenetic has emerged as an valuable research field for crop improvement under the present climatic changes. Epigenetic phenomenon Plant response to abiotic stresses is complex and involves multiple mechanisms, activated and controlled by massive changes in gene expression and nuclear organization (Budak *et al.*, 2015) [4]. Epigenetic diversity provide additional sources of variation within a species that could be captured and created improvement in crops. Evidence found from model plants indicates that epigenetic modifications, some of them inherited to the next generation, play an important role in this response. However, the role of epigenetic variation in adaptation of crops to abiotic stress is still not well understood (Niederhuth and Schmitz, 2014) [16]. It is important to keen understand the sources of epigenetic variation and the stability of newly formed epigenetic variants from one generation to another to use potential of epigenetic variation for improvement of crops. Epigenetics is new and fascinating field of genetics, completely meddling with classical knowledge of interaction between the hereditary material and the phenotype. Plant breeding has relied on combining the genetic diversity and variation present within species to develop various combinations of alleles which provide desired traits. If we talk about the epigenetics, It is "the study of mitotically and/or meiotically heritable changes in gene function that cannot be explained by changes in DNA sequence" (Russo *et al.*, 1996) [22]. Epigenetic changes, which include histone modifications, DNA methylation, chromatin remodelling and small RNAs, are thus heritable, but do not follow the known patterns of inheritance (Bräutigam *et al.*, 2013) [2].

Genetics and Epigenetics
In plants, active maintenance mechanisms are enable to transfer of epigenetic information throughout gametogenesis, then fertilization and early embryogenesis (Rival and Jaligot, 2012) [21]. However, epigenetic states may often be unstable. Therefore, to achieve plant improvement that may persist over generations to generations, there is need to learn more which epigenetic state can be stably transmitted (Kinoshita and Seki, 2014) [10]. The application and development of methods for widespread epigenome profiling and engineering may generate new avenues for using the potential of epigenetics in crop improvement.

AMA (ISSN: 00845841)

ISSN: 00845841
Volume 52, Issue 07, December, 2021

Biochemical changes of mango varieties associated with post harvest salicylic acid treatment and cardboard carton storage

Vishwakarma Shivendra Kumar[1], R.P Singh[2], R. N. Kewat[2], R.K. Yadav[3], Alok Kumar Singh[2*], N. R. Meena[4]

CCS PG College, Barabanki, U. P.[1]
Department of Biochemistry, ANDUA&T, Kumarganj, Ayodhya, U. P.[2]
Department of Crop Physiology, ANDUA&T Kumarganj, Ayodhya, U. P.[3]
Department of Extension Education, ANDUA&T Kumarganj, Ayodhya, U. P.[4]

Corresponding Author: 1*

Keywords:
Salicylic acid, pectin, polyphenol oxidase, peroxidase

ABSTRACT

The present investigation entitled "Biochemical changes of mango varieties associated with post harvest salicylic acid treatment and cardboard carton storage" had sixteen treatment combination replicated three times in Completely Randomized Design. At maturity condition mango fruits were harvested and stored in cardboard carton by post harvest application of salicylic acid at 0.1, 0.5 and 1.0 g/l doses. On the basis of two years data analysis it was revealed that maximum pectin content (1.96 and 1.97 %) was recorded in Langra variety at 15 days storage period by 0.5 g/l salicylic acid application. Maximum polyphenol oxidase enzyme activity (56.34 and 56.40 units/g) was reported in variety Dashahari at 5 days ambient storage period by 0.1 g/l salicylic acid treatment. Maximum peroxidase enzyme activity and beta carotene content (862.09 and 864.70 units/g, 3495.91 and 3496.73 µg/100g) was found in variety Dashahari at 20 days ambient storage period by 0.5 g/l salicylic acid application. Highest ascorbic acid content (18.57 and 18.62 mg/100g) was recorded in variety Dashahari at 5 days ambient storage period by 0.5 g/l salicylic acid application. Maximum TSS content (24.00 and 27.00 Brix^{0}) was reported in the variety Chausa at 20 days ambient storage period by 0.5 g/l salicylic acid application. Thus the present investigation indicated that post harvest application of enhanced the quality characteristics of mango fruits during storage in cardboard carton.

This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License

1. INTRODUCTION

India accounts for 10 per cent of total world production of fruit crops. Mango is the most important fruit covering 35 hectares of area and 28 per cent of the total production of fruits in the country. Uttar Pradesh, Bihar, Andhra Pradesh, West Bengal, Maharashtra, Gujarat, Karnataka and Tamil Nadu are major mango growing states in India. Mango production has improved substantially in Gujarat, Maharashtra, Andhra

The Pharma Innovation Journal 2021; 10(12): 898-899
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(12): 898-899
© 2021 TPI
www.thepharmajournal.com
Received: 03-10-2021
Accepted: 13-11-2021

AK Singh
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

Anand Kumar Pandey
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

Ankit Singh
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashish Kumar Srivastava
IRRI-SARC, NSRTC Campus, Varanasi, Uttar Pradesh, India

Sudhanshu Singh
IRRI-SARC, NSRTC Campus, Varanasi, Uttar Pradesh, India

Corresponding Author:
Anand Kumar Pandey
Department of Crop Physiology, A.N.D.U.A &T, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of various establishment methods on yield of rice under rainfed condition

AK Singh, Anand Kumar Pandey, Ankit Singh, Alok Kumar Singh, RK Yadav, Ashish Kumar Srivastava and Sudhanshu Singh

Abstract
The water crisis is threatening the sustainability of the irrigated rice system and food security in Asia. Our challenge is to develop novel technologies and production systems that allow rice production to be maintained or increased in the face of declining water availability. Water shortage is becoming severe in many rice-growing areas in the world, prompting the introduction of water-saving aerobic rice, which is direct-seeded in non-puddled, nonflooded aerobic soil, aerobic rice systems can reduce water use in rice production by as much as 50% 'Aerobic rice' and 'upland rice' are both grown under aerobic conditions. This paper introduces principles that govern technologies and systems for reducing water inputs and increasing productivity. We concluded that, Sanda technology mainly knows as double transplanting increases yield up to 8-10%.

Keywords: Rice, puddled, un-puddled, Sanda technology

Introduction
Food security depends on the ability to increase production with decreasing availability of water to grow crops. Rice, as a submerged crop, is a prime target for water conservation because it is the most widely grown of all crops under irrigation. To produce 1 kg of grain, farmers have to supply 2–3 times more water in rice fields than other cereals. In Asia, more than 80% of the developed freshwater resources are used for irrigation purposes; about half of which is used for rice production. Rapidly depleting water resources threaten the sustainability of the irrigated rice and hence the food security and livelihood of rice producers and consumers. In Asia, 17 million hectare (Mha) of irrigated rice areas may experience physical water scarcity and 22 Mha may have economic water scarcity by 2025. There is also much evidence that water scarcity already prevails in rice-growing areas, where rice farmers need technologies to cope with water shortage and ways must be sought to grow rice with lesser amount of available water. Traditional farming consists of technologies developed by farmers over decades of adjusting farming systems to local agro climatic and social conditions (Venkata Ramaiah and Rama Raju, 2004) [8]. Double step transplanting referred as kaiam is followed in Siddharth Nagar for establishment of crop of the traditional tall scented rice cultivar Kalanamak in rainfed lowland areas. Singh *et al.*, (2005) [6] enumerated potential benefits of the practice over normal transplanting as saving of seeds, staggered use of labor, protection from lodging, increased number of grains per panicle, larger panicles and about ten days of advanced maturity. Farmers practice a system of double transplanting of rice, locally known as Sanda to avoid crop failure from submergence. One-month old seedlings are transferred to another field with dense transplanting, and then re-transplanted to the main after the risk of flash flood is over. Scientists argue that the system would have lower yield and higher costs; This practice helps in producing healthy and taller seedlings that can easily overcome the adverse situation like high water depth at the time of transplanting (Rautaray, 2007; Ashim *et al.*, 2010) [4, 1]. In some flood-prone areas, farmers practice double transplanting (even triple transplanting) to produce taller seedlings for transplanting in standing water at the beginning of the season (India and Bangladesh) or to rejuvenate seedlings while waiting for the floodwater to recede to levels that can allow transplanting in the main field, proper management of seedlings in nurseries or after transplanting in the field (Ram *et al.*, 2010) [3]. It is also said that double transplanted rice produce more yield than normal transplanting with same aged seedlings (Ziagua, 2000; Satapathy, 2015) [9, 5].

The Pharma Innovation Journal 2021; 10(12): 900-902
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(12): 900-902
© 2021 TPI
www.thepharmajournal.com
Received: 10-10-2021
Accepted: 23-11-2021

AK Singh
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Anand Kumar Pandey
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Ankit Singh
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Ashish Kumar Srivastava
IRRI-SARC, NSRTC Campus, Varanasi, Uttar Pradesh, India

Sudhanshu Singh
IRRI-SARC, NSRTC Campus, Varanasi, Uttar Pradesh, India

Corresponding Author:
Alok Kumar Singh
Department of Crop Physiology, A.N.D.U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of NPK and chemical application on nitrogen uptake and yield of rice under rainfed condition

AK Singh, Anand Kumar Pandey, Ankit Singh, Alok Kumar Singh, RK Yadav, Ashish Kumar Srivastava and Sudhanshu Singh

Abstract
Crop productivity and quality are dependent on better availability of essential crop nutrients. However, application of nutrients at best optimum is essential depending on genotype for improved yield and quality. Field experiment was carried out to assess the influence of various levels of chemical and NPK fertilizers (F1: RDF-NPK Zn @ 80-60-40-5 kg N-P_2O_5-$K_2$0-Zn kg/ha), F2: F_1 + 70 kg $CaSO_4$ ha^{-1}, F3: F_2 + 1% KCl foliar spray at panicle initiation and F4: F_3 + Brown manuring with sesbania) on nitrogen uptake and yield components of drought tolerant rice variety under rainfed condition (Sahbhagi Dhan) at Instructional Farm, Acharya Narendra Deva University of Agriculture & Technology. Results revealed that application of (F4: F_3 + Brown manuring with sesbania) improved the nitrogen uptake, nitrogen use effciency and yield related traits *viz.* productive tillers $^{m-2}$, panicle length, 1000 grain weight, grain yield, as compared to other NPK levels. Among treatments F4 performed better than treatments. Results conclude that drought tolerant variety can yield better, by applying NPK combination with 70 kg $CaSO_4$ ha^{-1}, 1% KCl and sesbania with acceptable characteristics as compared to other treatments.

Keywords: Chemicals, NPK fertilization, $CaSO_4$ and KCl

Introduction
Rice is one of the most important cereal crops in the world. Rice ranks second among food grains, and half of the world's population depends on rice by getting the highest (26.2%) calories intake from it. Out of this almost 90% rice production and consumption takes place in Asian countries (Islam *et al.*, 2010) [7]. In Asia, the largest rice producing countries include China, India, Indonesia, Bangladesh and Pakistan (FAO, 2011) [6]. India is the second largest producer in the world. India has the largest area of rice cultivation at global level (44 m ha). Determination of optimum levels of NPK fertilizers is essential for obtaining maximum economic returns. According to Ananthi *et al.* (2010) [2] best rate of fertilizer application is that which gives maximum economic returns at least cost. Among various essential plant nutrients, the macro nutrients NPK are crucial for determining the yield and quality. It has been noticed that farmers utilize imbalanced dose of N fertilizer which leads to higher insects/disease attack ultimately producing lower yield (Mannan *et al.*, 2009; Alam *et al.*, 2011) [8, 1]. Therefore, there is dire need to determine the best level of NPK fertilizers which may give maximum crop productivity with minimum losses.
Itrogen is required by plants in the processes of photosynthesis and photosynthesis, and is involved in the energy reactions in the form of ATP; a key component of chlorophyll, proteins and enzymes; and assists the plants in the synthesis and use of carbohydrates (Mengel and Kirkby, 2001; Sara *et al.*, 2013) [9, 12]. Phosphorus plays a crucial role in the root proliferation, consistent grain filling, and higher grain yield and quality as well being a constituent of nucleotides such as in ADP and ATP energy bonds and also being involved in many processes such as photosynthesis, mitotic activities, tissue growth and development (Bhattacharyya and Jain, 2000) [3]. Plants cannot reach their maximum yield without adequate supply of phosphorus (Alam *et al.*, 2009; Murtaza *et al.*, 2014) [10]. Potassium is essential for the maintenance of electrical potential across cellular membranes and cellular turgor enhancing the cell expansion and enlargement, opening and closing of stomata, and pollen tube development. It is also involved in activation of many enzymes, translocation of nitrate and sucrose (Britto and Kronzucker, 2008) [4]. It is an important plant nutrient and is required in higher amount especially for rice. About 100 kg K is removed by rice plants for a yield of about 5 t ha-1. Intensive cropping systems and the use of modern rice varieties to obtain high yield causes a heavy decline of K in soil, especially in absence of K fertilization (Saha *et al.*, 2009) [11].

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: [illegible]
P-ISSN: [illegible]
[illegible]
DOI: [illegible]
Received: 22-11-2020
Accepted: 28-12-2020

Bhupender Mishra
Department of Crop Physiology
Acharya Narendra Deva
University of Agriculture &
Technology, Kumarganj
Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology
Acharya Narendra Deva
University of Agriculture &
Technology, Kumarganj
Ayodhya, Uttar Pradesh, India

Sumant Pratap Singh
Department of Plant Molecular
Biology and Genetic
Engineering, Acharya Narendra
Deva University of Agriculture
& Technology, Kumarganj
Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology
Acharya Narendra Deva
University of Agriculture &
Technology, Kumarganj
Ayodhya, Uttar Pradesh, India

AK Singh
Department of Crop Physiology
Acharya Narendra Deva
University of Agriculture &
Technology, Kumarganj
Ayodhya, Uttar Pradesh, India

Corresponding Author:
Bhupender Mishra
Department of Crop Physiology,
Acharya Narendra Deva
University of Agriculture &
Technology, Kumarganj,
Ayodhya, Uttar Pradesh, India

Effect of foliar application of plant growth regulators on growth and development, biochemical changes and yield of mung bean (*Vigna radiata* L.)

Bhupender Mishra, RK Yadav, Sumant Pratap Singh, Alok Kumar Singh and AK Singh

Abstract
A experiment was carried out under field condition at Students Instructional Farm of Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Ayodhya U.P. during *Dhanif* season 2019 based on a Randomized Block Design with three replications, variety Narendra Mung-1 with seven treatments were taken. The foliar sprayed of GA- 75 ppm was found most effective for increasing the plant height, number of branches per plant (5.30), total dry biomass per plant (29.75 g) and chlorophyll content SPAD value (10.28), protein content of seed (24.63%), number of pod per clusters (2.39), number of pods per plant (18.92), pod length (8.92 cm), number of seeds per pod (9.21), number of seeds per plant (455.33), 100 seed weight (3.62 g), seed yield per plant (15.07g), followed by foliar sprayed of NAA 150 ppm over rest of the treatments. Generally, the use of growth regulators as foliar application increased the yield and yield components.

Keywords: Mungbean, GA, chlorophyll content, physiological, NAA, salicylic acid

Introduction

Mung bean is botanically recognized as *Vigna radiata* Lin. Wilczek and belongs to the family *Fabaceae* (*leguminaceae*). The genus *Vigna* has been broadened to include about 155 species but only twenty-two species are native to India. Where they are grown in large numbers and are often grouped under distinct varieties and sub species. One of the most important among these species is *Vigna radiata* with dark-green foliage, spreading pods and green seeds. Green gram is the third most important pulse crop in India (Anonymous 2004) [1]. It has high nutritive value and due to this, has advantage over the other pulses. The seed contains 24.20% protein content, 1.30% fat, and 60.4% carbohydrates, calcium (Ca) 118 and phosphorus (P) is 340 mg per 100 g of seed, respectively (Imran *et al.*, 2016).

In India, pulses are grown over an area of 29.28 mha with a production and productivity of about 22.40 m tonnes and 765 kg/ha, respectively. This covers about 20% of total area and 8% of total grain production in India. India has largest area and production of pulses in the world. All over India, total pulse production was recorded about 23.95 million tonnes in (2017-18).

Naphthalene acetic acid is a synthetic plant hormone in the auxin family and is an ingredient in many commercial plant rooting horticultural product, it is a rooting agent and used for the vegetative propagation of plants from stem and leaf cutting. Naphthalene acetic acid has been shown to greatly increase cellulose fiber formation in plants when paired with another phytohormone called gibberellic acid. Because it is in the auxin family it has also been understood to prevent premature dropping and thinning of fruits from stems.

Gibberellic acid may play an important role as this is known to affect many facets of plant life, including, seed germination, leaf expansion, N-fixation, phloem loading, water and mineral uptake, assimilate translocation, harvest index. Gibberellic acid occupies a prominent position in mediating a variety of plant physiological processes including seed germination, leaf expansion, flower and fruit set, dry matter production, photosynthesis, translocation of food material and synthesis of mRNA coding for hydrolytic enzymes (Mohd Mazid 2014) [12].

Materials and Methods

The field experiments were carried out during *kharif* seasons of 2019 in Students instructional Farm of Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya. Solution of GA- 25 ppm, GA- 50 ppm, GA-75 ppm, NAA 50 ppm, NAA (100 ppm) and NAA (150 ppm) were prepared.

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
www.chemicalstudies.com
2021; 9(4): 2922-2927
© 2021 IJCS
Received: 11-06-2021
Accepted: 20-11-2021

Rohit Nandan
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sumant Pratap Singh
Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sumant Pratap Singh
Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of seed priming with plant growth regulators on growth, biochemical changes and yield of Mung bean (*Vigna radiata* L.)

Rohit Nandan, RK Yadav, Sumant Pratap Singh, Alok Kumar Singh and AK Singh

DOI: https://doi.org/10.22271/chemi.2021.v9.i4ao.11673

Abstract
Seed priming is employed for better crop stand and higher yield in a range of crops. In order to evaluate the effect of seed treatments with growth regulators on the yield and yield components of mung bean (*Vigna radiata* L.) variety, a experiment was carried out under field condition at students instructional farm of Acharaya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya U.P. during *kharif* season 2019 based on a Randomized Blok Design with three replications variety of Narendra Mung-1 with seven treatments were taken. The maximum germination percentage (90.25%) was recorded with seed priming of GA_3- 100ppm over other treatments including control. Growth characters as plant height, total dry biomass, and chlorophyll content and nitrogen content in green leaves and protein content in mature seeds were found significantly superior with seed priming of GA_3-100ppm followed by NAA-100ppm over control. Yield and yield contributing traits *viz*: number of pod clusters per plant (8.33), number of pods per plant (48.26), pod length (7.66cm), number of seeds per plant (416.66), number of seeds per pod (10.33), 100 seed weight (3.92g), seed yield per plant (11.36g), seed yield (11.66 q h^{-1}) and harvest index (36.06%) were also found statistically superior with seed priming of GA_3-100ppm followed by priming in NAA-100ppm over control. Generally, the use of growth regulators as a pre-treatment of seed increased the yield and yield components.

Keywords: Mung bean, GA_3, biochemical, physiological, NAA, salicylic acid

Introduction
Mungbean is the third most important pulse crop of India after chickpea and pigeonpea (Singh and Singh, 2014) [22]. Mung bean (*Vigna radiata* (L.) Wilczek) is native to India and central Asia especially in tropical and subtropical Asia and belong to family Fabaceae and sub- family Papilionaceae (Singh and Singh, 2014) [22]. The nutritive value of mungbean is high and easily digestible protein with approximately 25-28%, oil 1.0-1.5%, fiber 3.5-4.5%, ash 4.5-5.5%, carbohydrate 62-65%, water 9.1%, and vitamins on dry weight basis (Singh *et al*., 2014) [22]. In India, pulses are grown over an area of 29.28 m ha with a production and productivity of about 22.40 m tonnes and 765 kg/ ha, respectively (Anonymous, 2017) [3]. This covers about 20% of total area and 8% of total grain production. These are the cheapest and best sources of vegetable proteins consisting of about 27 per cent of total dietary protein in our country and India has largest area and production of pulses in the world.
Plant growth regulators (PGRs) are known to influence plant growth and development at very low concentrations. They are non-toxic to plants over a wide range of concentration and effective in promoting the root system of a large number of plant species (Taiz and Zeiger 2006) [23]. Gibberellins (GAs) are the most important natural growth regulators and generally involved in the growth and development of different plant. They control seed germination, leaf expansion, stem elongation, and flowering (Magome *et al*., 2004 and Kumar *et al*., 2018) [15, 11, 12]. Gibberellic acid (GA) is used to induce great changes in the growth characters, chemical composition, and yield criteria of the plant (Choudhury *et al*., 2013) [8].
Salicylic acid (SA) is a phytohormone of phenolic nature. It is ubiquitous in plants generating a considerable impact on plant growth, development, mineral uptake and transport, photosynthesis, and transpiration. Salicylic acid and other salicylates are known to affect

The Pharma Innovation Journal 2021; 10(1): 589-594

www.ThePharmaJournal.com

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2021; 10(1): 589-594
© 2021 TPI
www.thepharmajournal.com
Received: 03-11-2020
Accepted: 12-12-2020

RK Yadav
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Manendra Kumar
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pradip Kumar Saini
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Brijesh Kumar
Department of Agriculture
Faculty of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Pandey
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Ankit Singh
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Pradip Kumar Saini
Department of Crop Physiology
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of foliar application of different nutrients on growth and yield of wheat (*Triticum aestivum* L.) under sodic soil

RK Yadav, Manendra Kumar, Pradip Kumar Saini, Alok Kumar Singh, AK Singh, Brijesh Kumar, AK Pandey and Ankit Singh

DOI: https://doi.org/10.22271/tpi.2021.v10.i1h.5594

Abstract
The present investigation entitled "Effect of foliar application of different nutrients on growth and yield of wheat (*Triticum aestivum* L.) under sodic soil" was carried out at main experiment station (MES) of Acharaya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). During *rabi* season - 2017-18. The experiment was laid in field condition with randomized block design and three replications. Seven treatments comprised of five different nutrients as zinc sulphate (0.5%) and (0.7%), boric acid (0.2%) and (0.4%) and potassium nitrate (0.1%) and (0.3%) applied as foliar application at 35 DAS of crop growth. A controlled set was also maintained. The observations were recorded as growth parameters at, 40, 60 and 90 DAS, yield and yield attributing traits were recorded at harvest. All the foliar application of nutrients increased the growth characters viz., plant height (cm), number of tillers per m^2, dry weight plant was found significantly superior with foliar application of 0.7% zinc sulphate at all the stages of crop over control. Yield characters viz., length of spike (10.5cm), No. of grains per spike (45.10), no. of grains per plant (40.20), Grain yield/m^2 (285), grain yield /ha^1 (38.59), test weight (38.26g) and harvest index (29.80%) were recorded significantly higher with foliar application of 0.7% zinc sulphate followed by foliar application of 0.3% of potassium nitrate over control.

Keywords: wheat, zinc sulphate, sodicity, boric acid, potassium nitrate

Introduction
Wheat (*Triticum aestivum* L.) is a staple food of the world and belongs to family Poaceae (Gramineae). It is most important staple food of about two billion people (36% of the World population). About 55% of the world population depends on wheat for intake of about 20% of food calories. Wheat is self-pollinated crop and it has been described as the 'King of cereals'. It is the world's most widely cultivated food crop and is primarily grown in temperate regions and also at higher altitude under tropical climatic areas in winter season. Wheat is the single most important cereal crop that has been considered as integral component of the food security system of the several nations. It is grown in the world with an area of 221.60 million hectare, production of 728.3 million tonnes with productivity of 3.3 tonnes per hectare (Anonymous 2015) [1]. In India, it is grown in an area of 30.47 million hectare, production 95.85 million tone's with a productivity of 3.15 tonnes per hectare. Uttar Pradesh having first rank in respect of both area (9.95 million hectare) and production (30.24 million tone's) with a productivity of 3.10 tone's per hectare in 2015 (Anonymous 2015) [1]. Plants need large quantities of potassium, the uptake of which frequently exceeds the uptake of nitrogen. Not only the plant tissues had higher K^+ content than the other cations but K^+ regulates effectively many physiological and biochemical processes (Bajwa, 1994) [2]. Potassium utilization by plants through foliar application is well recognised and is being practiced in agricultural advanced countries (Fernandez and Eichert, 2009) [3]. Foliar applied fertilizers often show a better efficacy which may help to reduce the required dose. Therefore, this study was planned to compare different concentrations of K_2SO_4 and KNO_3 for foliar application to obtain optimum wheat yield under different wheat planting techniques. Sodic soils are characterized by a disproportionately high concentration of sodium (Na) in their cation exchange complex. They are usually defined as containing an exchangeable sodium percentage greater than 15%. These soils tend to occur within arid to semiarid regions and are innately unstable, exhibiting poor physical and chemical properties, which impede water infiltration, water availability and

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; 9(1): 3270-3272
© 2021 IJCS
Received: 15-10-2020
Accepted: 30-11-2020

Manendra Kumar
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pradip Kumar Saini
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sumant Pratap Singh
Department of Plant Molecular Biology & Genetic Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Brijesh Kumar
Department of Agriculture Biochemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RN Kewat
Department of Agriculture Biochemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Pradip Kumar Saini
Department of Crop Physiology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of foliar application of different nutrients on biochemical changes of wheat (*Triticum aestivum* L.) under sodic soil

Manendra Kumar, Pradip Kumar Saini, RK Yadav, Alok Kumar Singh, Sumant Pratap Singh, Brijesh Kumar and RN Kewat

DOI: https://doi.org/10.22271/chemi.2021.v9.i1at.11737

Abstract
The present investigation entitled "Effect of foliar application of different nutrients on biochemical changes of wheat, under sodic soil" was carried out at main experiment station (MES) of Acharya Narendra Dev University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P). During Rabi season 2017-18. The experiment was laid in field condition with randomized block design and three replications& variety NW-1014. Seven treatments comprised of five different nutrients as zinc sulphate (0.5%) and (0.7%), boric acid (0.2%) and (0.4%) and potassium nitrate (0.1%) and (0.3%) applied as foliar application at 35 DAS of crop growth. A controlled set was also maintained. The observations were recorded parameters biochemical changes at 40, 60 and 90 DAS. All the foliar application of nutrients increased the growth characters and biochemical changes superior over control. Total chlorophyll content and total carbohydrate was found significantly superior with foliar application of 0.7% zinc sulphate at all the stages of crop over control.

Keywords: Wheat, chlorophyll, carbohydrate, zinc sulphate, boric acid

Introduction
Wheat (*Triticum aestivum* L.) is a staple food of the world and belongs to family Poaceae (Gramineae). It is most important staple food of about two billion people (36% of the World population). About 55% of the world population depends on wheat for intake of about 20% of food calories. Wheat is self-pollinated crop and it has been described as the 'King of cereals'. It is the world's most widely cultivated food crop and is primarily grown in temperate regions and also at higher altitude under tropical climatic areas in winter season. Wheat is the single most important cereal crop that has been considered as integral component of the food security system of the several nations. It is grown in the world with an area of 221.60 million hectare, production of 728.3 million tonnes with productivity of 3.3 tonnes per hectare (Anonymous 2015) [1]. In India, it is grown in an area of 30.47 million hectare, production 95.85 million tone's with a productivity of 3.15 tonnes per hectare. Uttar Pradesh having first rank in respect of both area (9.95 million hectare) and production (30.24 million tone's) with a productivity of 3.10 tone's per hectare in 2015 (Anonymous 2015) [1]. The fast growing population of our country makes it imperative to enhance wheat production accordingly. Wheat is cultivated on an area of 8693 thousand hectares with a total production of 25,286 thousand tonnes during year 2012-13 (GOP, 2012-13). The major fraction of potash fertilizer directly applied to soil gets fixed by the clay fraction and becomes unavailable to crop plants (Ali *et al.*, 2010) [2]. The available zinc in Indian soil ranges between 0.08-20.5 ppm. Application of zinc has been found to boost the growth and yield of crops to a great extent. Zinc deficiency includes rosetting and poor tillering leading to decreased productivity in crop plants. Since zinc is co-factor of carbonic anhydrase and aldolase, therefore, it may adversely affect enzyme activities and carries corresponding metabolic reactions when zinc is deficient in soil. Zinc is also involved in synthesis of protein, tryptophan (amino acid). Superoxide dismutase (SOD) activity is much lower but can be restored *in vitro* by resupplying zinc to the assay medium, indicating that the zinc is an essential structural components for normal functioning of superoxide dismutase enzyme. In zinc stressed plants, protein synthesis is inhibited and amino

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902

Molecular characterization and genetic diversity of different rice (*Oryza sativa* L.) genotypes for salt tolerance

Reeshu Singh, Pankaj Singh, DK Dwivedi, S Prasad, Ankit Singh and Alok Singh

Reeshu Singh
Department of Plant Molecular Biology and Genetic Engineering, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Pankaj Singh
Department of Plant Molecular Biology and Genetic Engineering, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

DK Dwivedi
Department of Plant Molecular Biology and Genetic Engineering, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

S Prasad
Department of Plant Molecular Biology and Genetic Engineering, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Ankit Singh
Department of Crop Physiology, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Alok Singh
Department of Crop Physiology, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
Reeshu Singh
Department of Plant Molecular Biology and Genetic Engineering, A.N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

DOI:

Abstract
The present study involved evaluation of 12 genotypes of rice under control salt and field conditions. The characters studied were days to 50% flowering, plant height (cm), panicles bearing tillers/plant, spikelets/panicle, grains/panicle, panicle length, spikelet fertility (%), test weight (g), biological yield/plant (g), harvest index (%), and grain yield plant (g) After 7 days of salinisation, all the genotypes viz. IR68144-2B-2-2-3-1-120, IR-68144-2B-2-2-3-1-127, IR-91167-99-1-1-1-3, IR-91167-133-1-1-2-3, NUD-3, NDR-359, IR-28, HL-478, NUD-2, CSR-13, Ayyar and NDRK-2008 were salinity tolerance. After 14 days of salinisation, HL-478 were tolerant, while IR68144-2B-2-2-3-1-120, IR-68144-2B-2-2-3-1-127, IR-91167-133-1-1-2-3, NUD-3, NUD-2 and CSR-13 were moderately tolerant genotypes and NDR-359 were susceptible genotype. After 21 days of salinisation, HL-478 were tolerant genotype, while IR-91167-99-1-1-1-3, NUD-3, NUD-2, CSR-13 and NDRK-2008 were moderately tolerant genotypes and genotypes IR68144-2B-2-2-3-1-120, IR-68144-2B-2-2-3-1-127, IR-91167-133-1-1-2-3, NDR-359, IR-28 and Ayyar were susceptible genotype. Under salinity condition at reproductive stages of rice genotypes Ayyar followed by showed highly tolerant to salinity at reproductive stage. The genotype NUD-3, NDRK-2008 and IR-91167-99-1-1-1-3 exhibited highly susceptible to salinity at reproductive stage. The higher magnitude of positive direct effect on grain yield/plant exerted by biological yield/plant and harvest index under control condition, under saline condition biological yield/plant followed by harvest index and spikelets/panicle showed positive and direct effect on grain yield/plant. Under field condition positive and direct effect on grain yield exerted by biological yield/plant followed by harvest index, spikelets/panicle and spikelet fertility. In the present study, the 12 genotypes of rice were grouped into four different non-overlapping clusters under saline, field and control conditions. The highest intra cluster distance was recorded for cluster IV under controlled condition, cluster II under saline condition and cluster III under field condition. Under controlled condition highest inter cluster distance recorded in cluster II and cluster IV. Under saline condition, cluster II and cluster III had highest inter cluster distance. Under field condition, the highest inter cluster distance recorded in cluster I and cluster IV. RM 10772 exhibited polymorphism in 12 rice genotypes, while RM10745 exhibited Monomorphism in 12 rice genotypes.

Keywords: Cluster analysis, genetic diversity, rice genotypes, SSR marker, salt tolerance

Introduction
Rice is one of the most important cereal crops in the world. One in every three persons depends on rice for more than half of their daily food requirement (Khush and Virk, 2000). Rice (*Oryza sativa* L.) is the world's most important crop and more than half of the world's population depends on it for food (calories and protein especially in developing countries) grain. Asia is the largest producer of rice (97%) with an average productivity 3.9 tonnes per hectare. China and India account for about 50% of the world's rice area and 56% of production (Hossain and Pingali, 1998). Rice is a most important cereal crop in India and it contributes about 45% to the cereal production, 41% of the total food grain production and accounts for 20-25 per cent of the agricultural GDP.
Salinity is one of the major abiotic stresses that substantially limiting crop production and reduces the average yield of major crops by more than 50% (Abdallah *et al.*, 2016) [1]. The deleterious effects of salt stress on agricultural yield are significant, mainly because crops exhibit slower growth rates, reduced tillering and, over months, reproductive development is

This content is available online at AESA

Archives of Agriculture and Environmental Science

Journal homepage: journals.aesacademy.org/index.php/aaes

ISSN: 2456-6632

REVIEW ARTICLE

Boron in crop production from soil to plant system: A review

Anil Kumar Singh[1*], Alok Kumar Singh[2] and Jay Prakash Singh[3]

[1]Department of Agricultural Chemistry and Soil Science, S.M.M. Town P.G. College, Ballia - 277001 (Affiliated: Jananayak Chandrashekhar University, Ballia), (Uttar Pradesh), INDIA
[2]Department of Crop Physiology, College of Agriculture, ANDUA&T, Kumarganj, Ayodhya-224229, (Uttar Pradesh), INDIA
[3]Department of Plant Pathology, SMM Town P.G. College, Ballia - 277 001 (Affiliated: Jananayak Chandrashekhar University, Ballia), (Uttar Pradesh), INDIA
*Corresponding author 's E-mail: singhanil80@gmail.com

ARTICLE HISTORY

Received: 04 November 2019
Revised received: 11 April 2020
Accepted: 20 May 2020

Keywords

Boron
Role of boron
Soil and foliar application

ABSTRACT

The deficiency of boron is spreading rapidly in Indian soils. Boron deficiency in crops is more widespread than deficiency of any other essential micronutrient. However, imbalanced or excess use of boron fertilizers found to impose negative impact on crops due to very narrow range of boron deficiency and toxicity in soil and plants which increases production cost also. Therefore, optimized boron fertilizer supply in boron deficient soils is important in order to attain normal crop growth, yield and high-quality produce. It this review the role of boron in crop production, its deficiency in crop plants has been discussed.

©2020 Agriculture and Environmental Science Academy

Citation of this article: Singh, A.K., Singh, A.K. and Singh, J.P. (2020). Boron in crop production from soil to plant system: A review. *Archives of Agriculture and Environmental Science*, 5(2): 218-222, https://dx.doi.org/10.26832/24566632.2020.0502020

INTRODUCTION

The essentiality of boron (B) for the growth and development of higher plants was demonstrated by Warington in the year (1923) and considered as an essential element for plant growth and development (Pollard *et al.*, 1977; Marschner, 1995). B plays an important role in both structural and functional integrity of plasma membrane (Pollard *et al.*, 1977). B has been reported to affect the plant growth due to its role in cell division, expansion, cell wall formation and stabilization, lignification and xylem differentiation (Marschner, 1995). B has been implicated in counteracting toxic effects of aluminum on root growth of dicotyledonous plants (Dale *et al.*, 1998). It imparts drought tolerance to the plant (Rattan and Goswami, 2002). In muskmelon, application of B improved plant growth and fruit quality, and in addition the incidence of chilling injury decreased in harvested fruit during cold storage at 5°C (Combrink *et al.*, 1995). B is continuously required for the normal growth of most plants, otherwise, plants grown in low B containing media exhibit B deficiency symptoms of various forms (Gupta, 1993). The deficiency of B spreading rapidly in Indian soil from 2% in 1980 (Katyal and Vlek, 1985) which reached to 52% soils (Singh, 2012). B deficiency has mostly been reported in the soils of Assam, Bihar, Meghalaya, West Bengal, Jharkhand and Odisha mainly in acid red and lateritic soils including high pH calcareous soils (Behera *et al.*, 2009). Now next to zinc, B has become an important micronutrient in Indian Agrarian (Sathya *et al.*, 2009) required for normal plant growth and obtaining high quality crop yields (Murmu *et al.*, 2014). The important facts pertaining to this important micronutrient is furnished in Table 1.

BORON IN SOIL SYSTEM

Among the essential micronutrients B is the only non-metal and present in non-ionic form. Total B contents in Indian soils ranged between 7 to 630 mg B kg^{-1} soils (Prasad *et al.*, 2014). Singh *et al.* (2015) observed that soils were highly deficient in available B with mean contents of 0.55, 0.49, 0.66 and 0.62 mg kg^{-1} in Chandauli, Mirzapur, Sant Ravidas Nagar and Varanasi district, respectively. Availability of B in soil is influenced by several factors including soil reaction, soil moisture, active calcium and organic matter content (Dregne and Power, 1942). Light textured soils (sandy loam and loamy sands) found to be deficient in B content because they were well drained and had good leaching (Abid *et al.*, 2002). Most of the tea soils of Darjeeling hills are sandy loam and loamy sand soil (light textured) except

Journal of Pharmacognosy and Phytochemistry 2020; 9(5): 1840-1844

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(5): 1840-1844
Received: 06-06-2020
Accepted: 04-08-2020

Ankit Singh
M. Sc (Ag), Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Reeshu Singh
Research Scholar, Acharya Narendra Dev University of Agriculture & Technology, Narendra Nagar,(Kumarganj), Ayodhya, Uttar Pradesh, India

Anubhuti Singh
Research Scholar, Acharya Narendra Dev University of Agriculture & Technology, Narendra Nagar,(Kumarganj), Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Asst. Prof. Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

AK Singh
H.O.D, Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Corresponding Author:
Ankit Singh
M. Sc (Ag), Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Effect of salinity on biochemical and enzymatic activities of rice (*Oryza sativa* L.)

Ankit Singh, Reeshu Singh, Anubhuti Singh, Alok Kumar Singh and Al Singh

Abstract
In the present study deals with the *Oryza sativa* L. was selected for the physiological and biochemic studies in laboratory condition for 10 days (2nd, 4th, 6th, 8th and 10th day) that were carried unde different salinity levels. Six genotypes of rice crop i.e. tolerant- CSR-36, CSR-43, Usar Dhan-3 ar Susceptible- Swarna Sub-1, IR-28, Pusa-44, were used to germinate under varying concentrations NaCl i.e.0 to 100 mM. The salt stress significantly reduced the germination percentage with increasin salt stress from 0 to 100 mM NaCl. A continuous decrease in carbohydrate content with increase in sa stress was observed in all the varieties. The rate of proline accumulation was observed maximum in Usa dhan-3 at 100 mM NaCl stress. The enzymetic activity of catalase and α-amylase was higher in contr than sample induced with salinity stress. This study overall showed better tolerance to salt stress with lesser extent of antagonistic effect of NaCl on Usar dhan -3 than any other variety.

Keywords: Salt stress, germination, *Oryza sativa*. L., proline

Introduction
Rice (*Oryza sativa* L.) is among the most consumed cereals in the world. Production of ric (*O. sativa* L.) ranks second among food grains, and half of the world's population subsists o rice by receiving the highest (26.2%) calories intake from it (FAO, 2009) [5]. In Asia where i covers half of the arable land used for agriculture in many countries. More than 90% of rice i produced and consumed in Asia and it is the only major cereal crop that is consumed almos exclusively by human. India is the largest rice growing country accounting for about one-thir of the world acreage under the crop. About 84% of rice production growth has been attributec to the use of modern technologies. However, salinization of paddy land in the coastal regio may develop by advancement of sea or rising of the saline ground water to the upper surface o the soil. This problem is due to high levels of evaporation and salt accumulation in the roo zone in arid and semi arid areas (FAO, 1997) [4].

Salinity is one of the major abiotic factors that limits plant growth and productivity in many regions of the world due to increasing use of poor quality of water for irrigation and soi salinization (Munns and Tester 2008, Rozema and Flowers 2008, Kronzucker and Britto 2011 Zhang and Shi 2013) [12, 7, 8, 19]. One of the most detrimental effects of salinity is the accumulation of Na^+ and Cl^- ions in tissues of plants subjected to soils with high con centrations of NaCl (Maathuis *et al.* 2014) [10]. High concentration of Na^+ inhibits uptake of K^+ which is an essential macronutrient for plants growth and development that results in low productivity and may even cause death (Kronzucker *et al.* 2013, Gupta and Huang 2014) [9, 6]. Plants have developed various physiological and biochemical mechanisms to maintain a relatively stable intracellular environment via accumulating various solutes under saline condition (Gupta and Huang 2014, Roy *et al.* 2014) [6, 16]. The osmotic adjustment in plants can maintain the uptake of water and the turgor of cell, allowing regular physiological metabolisms (Radić *et al.* 2013) [14]. Proline, as an important osmoprotectant, contributes to osmotic adjustment, protecting enzymes from oxidative damage under saline condition (Ashraf and Harris 2004, Gupta and Huang 2014) [6]. In addition, under saline condition, the accumulation of other compounds such as soluble sugar, which at higher temperatures are non-toxic to cytoplasmic functions, allowing turgor maintenance and/or protection of macromolecular structure against the destabilizing effects of the decrease in water activity, has also been reported in many plants species (Juan *et al.* 2005) [17].

A major challenge towards world agriculture involves production of 70% more food crop for an additional 2.3 billion people by 2050 worldwide. Salinity is a major stress limiting the increase in the demand for food crops. More than 20% of cultivated land worldwide (~ about 45 hectares) is affected by salt stress and the amount is increasing day by day.

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-10: 290-296

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-10 pp. 290-296
Journal homepage: http://www.ijcmas.com

Original Research Article

Identification of Rice Genotypes for Submergence and Yield Attributing Traits

Saurabh Dixit[1*], S.P. Giri[1], V. Prasad[1], S.K.S. Rajpoot[1], A.K.Singh[2], Alok Kumar Singh[2] and D.K. Dwivedi[1]

[1]Crop Research Station, (ANDUAT), Masodha, Ayodhya, India
[2]A.N.D.U.A.T. Kumarganj, Ayodhya, India

**Corresponding author*

Keywords

Rice, Lines, Survival percentage, Submergence, Water depth and Yield

A B S T R A C T

Altogether 334 rice lines alongwith8 global check varieties were tested for submergence survival and yield performance at Crop Research Station, Masodha, Ayodhya. These lines and check varieties, namely IR 64-Sub 1, Swarna-sub 1, Sambha Mahsuri-Sub 1.. Ciherang-Sub1, TDK1, Ciherang, RC18, SambhaMahsuri and 3 local check viz. Swarna, MTU 1010 and Sahabagidhan were laid out in augmented design with 10 blocks. For survival testing in submergence, the experiment was conducted in the submergence pool and for yield performance (optimal condition), the experiments was conducted in the irrigation field. Each entry was direct sown in two rows of 3 meter length and after 25 days of sowing complete submergence of one meter water depth was imposed for 20 days. Data recorded for submergence survival as no. of plant counted before and after submergence. In yield performance experiments observation recorded on days to 50% flowering, plant height, Ebt/m2, total biomass, harvest index and yield kg/ha. Among 334 lines none of the lines have recorded 100% survival however, eight lines viz., TTB 944-31-10-1-2 (95.2%), CR-2859-1-S-B-2-1-B-B-5-1 (94.7%), IR103410-B-B-2-3 (87.5%), CR 2851-S-1-B-4-1-4-1-1 (IET27051) (84.2%), IR 97034-21-2-1-3 (69.6%), IR09A130 (66.7), CR 2859-S-B-2-1-B-7-1 (60%) and NSIC 2016 RC 468 (57.9%) survived and 42 lines falls under 20-56 % survival, were recorded. The entries were selected on the basis of (i) selection based on survival % and vigor, (ii) selection based on productivity under submergence, (iii) selection based on the variables of morphological and agronomic characters. The entry IR103410-B-B-2-3 (87.5%) (4667 kg/ha),IR 97034-21-2-1-3 (69.6%)(4667 kg/ha),TTB 944-31-10-1-2(95.2%) (4000 kg/ha) and NSIC 2016 RC 468 (57.9%) (3333 kg/ha) also good for survival and yield. These lines are considered promising for tolerant to submergence as well as yield.

Introduction

Rice (*Oryza sativa* L.) is one of the most important crops of the world and provides food to more than 50% global population. More than 90% of the world's rice is grown and consumed in Asia, where 60% of the earth's people live. It was estimated that 35-60% of the calories consumed by 3 billion Asians comes from rice. Rice demand in

Int.J.Curr.Microbiol.App.Sci (2020) 9(5): 38-45

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 5 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.905.003

A Physiological Approach: Nitrogen Management and Sub-1 Rice Varieties Grown in Flood Prone Ecosystem

Anand Kumar Pandey*, A. K. Singh, Alok Kumar Singh and R. K. Yadav

Department of Crop Physiology, A.N.D.U.A&T, Kumarganj, Ayodhya (U.P.), India

**Corresponding author*

Keywords

Physiology Approach; Nitrogen Management; Flood Prone; Sub-1; Rice

Article Info

Accepted:
05 April 2020
Available Online:
10 May 2020

A B S T R A C T

Farmers in flood prone areas mostly use only urea without any solid recommendations. Possibilities of recurrent flooding/submergence during the season are one of reasons for avoiding nutrient application, through it has a strong bearing on regeneration growth and yield of rice varieties after floods, hence suitable nutrient management strategies are essential to enhance the productivity. However, higher dose of N (60 Kg ha^{-1} as basal) showed positive response on plant growth during submergence but higher elongation caused plant mortality during post oxidative phase. Meanwhile, popular package and practices among flood prone farmers, addition of Zero Kg N before submergence to minimized risk was not justified. So far, higher N applied as basal showed negative effect on survival during post submergence. Plants grown without N fertilizer before submergence showed 12-23% plant mortality in both Sub-1 rice varieties during post oxidative phase even though submerged field was substituted with higher dose of N @60 kg ha^{-1} at 5th days after desubmergence, mainly due to energy starvation during submergence. After de-submergence frequent addition of split doses of N might be helpful to meet out the demand of submerged plants for faster recovery.

Introduction

Rice is semi aquatic plants. Thus, traditionally grown rice cultivars in flooded soil have a reputation for growing well under flooded conditions. About 22 million ha of rice in South Asia is prone to flash flooding. In India, about 17.4 million ha of rainfed lowland rice are grown each year, of which 5.2 million ha are submergence-prone, out of the 2.65 million ha flash-flood prone areas, about 1.6 million ha rice are frequently inundated. Even during normal years, approximately 20% of the geographical area is affected by flooding, due to serious crisis most of the rice cultivars die within days of complete submergence, often resulting in total crop loss (Mackill *et al.*, 2012).

These losses heavily affect rice farmers where alternative livelihood and food security options are limited. Farmers of flood prone

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemjournal.com
IJCS 2020; 8(2): 2248-2253
© 2020 IJCS
Received: 16-01-2020
Accepted: 18-02-2020

Anand Kumar Pandey
Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Anand Kumar Pandey
Department of Crop Physiology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Foliar spray of salicylic acid and oxalic acid ameolirates temperature (Heat) stress on wheat at anthesis stage

Anand Kumar Pandey, AK Singh, Alok Kumar Singh and RK Yadav

DOI: https://doi.org/10.22271/chemi.2020.v8.i2ah.9085

Abstract
This study endeavors to quantitatively cognize the impact of changes in physiological mechanism due to climate change on wheat at vegetative stage and reproductive stage of crop. This experiment was conducted and evaluated for wheat crop using two chemicals salicylic acid and oxalic acid and meteorological data from a field site at Students Instructional Farm of the Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during Rabiseasons of 2015-16 and 2016-17. This experiment was planned under FRBD (Factorial Randomized Block Design) with three replications and two date of sowing *viz*; 25th November and 25th December with two varieties NW-5054 and NW-2036.Results indicated that physiological traits were adversely affected by time of sowing due to onset of high temperature during crop growth and particularly grain filling. All the treatments reduced the detrimental effect of heat stress on both the varieties by improving physiological traits which ultimately helped in obtaining higher yield.

Keywords: Wheat, climate change, heat stress, salicylic acid, oxalic acid

Introduction
Wheat (*Triticum aestivum* L.) is the second most important staple food crop of the world. It accounts nearly 30% of global cereal production covering an area of 220 million hectare with an average productivity of 3.2 tonnes ha^{-1} (FAO, 2015) [6]. Wheat production in the year 2017-18 was recorded as 92.08 million tonnes covering an area of 26 million hectare in India (DES, 2014) [2]. The country further required 100 million tonnes of wheat by the year 2030 to fulfill the demands of the growing population which poses a major challenge in the background of prevailing changed climatic scenario. Crop performance and yield is the ultimate result of interaction of a crop genotype and its environment. Among various stresses, abiotic stresses such as heat, drought and salinity are considered as major threats to sustainable wheat production in India. According to world estimates, average yield losses in agricultural crops up to 50% is mainly due to different abiotic stresses as a result of these changing climatic conditions (Theilert *et al.*, 2006) [18]. The growth and yield of wheat crop is adversely affected by different environmental stresses like high temperature, soil moisture deficit, low light intensity etc. The cultivation of wheat is limited by temperature at both ends of the cropping season and high temperature stress has an adverse effect on wheat productivity. The terminal heat stress was at anthesis and grain filling stages accelerate maturity and significantly reduce grain size, weight and yield (Kamal *et al.*, 2013) [6]. High temperature is considered to be most important factor to reduce the wheat yield among the various stresses (Modarresi *et al.*, 2010) [13]. Heat stress reduces the leaf area, the duration of vegetative growth and leaf number in wheat. Heat stress is injurious to the photosynthetic apparatus during reproductive growth of wheat, diminish source activity and sink capacity, which results in reduced productivity and enhance leaf senescence causing reduction in green leaf area during reproductive stages. The rapid leaf senescence ultimately resulted in less productive tillers/plant, which is one of the major causes of yield loss of wheat. High temperature above 32 ^{0}C has been reported reducing grain yield and grain weight during grain filling, it's considered as a major determinant of wheat development and growth, decreasing yields by 3-5 % per 1 ^{0}C increase above 15 ^{0}C (Wollenweber *et al.*, 2003) [19].

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 1130-1133
Received: 01-01-2020
Accepted: 04-02-2020

Ankit Singh
M. Sc (Ag), Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

AK Singh
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Anand Kumar Pandey
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Reeshu Singh
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Anubhuti Singh
Research Scholar, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Yadav
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Corresponding Author:
Alok Kumar Singh
Ph.D., Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Effect salinity on germination percentage (%) and seed vigour index of rice (*Oryza sativa* L.)

Ankit Singh, AK Singh, Anand Kumar Pandey, Alok Kumar Singh, Reeshu Singh, Anubhuti Singh and RK Yadav

DOI: https://doi.org/10.22271/phyto.2020.v9.i2s.11003

Abstract
Present investigation was conducted during *Kharif* 2017-18 in laboratory, at experimental study Department of Crop Physiology, Narendra Deva University of Agriculture and technology, Kumarganj Faizabad (U.P.). Soil salinity has become a severe threat to ensure food security. salinity-imposed limitations on plant growth. At the present, salinity level stimulates many of the metabolic processes involved in phases (2nd, 4th, 6th, 8th and 10th day) of germination, resulting in an improved performance of germination and higher. Experiment was laid out in complete randomized design (CRD) with three replication on six genotypes of rice crop *i.e.* tolerant- CSR-36, CSR-43, Usar Dhan-3 and Susceptible-Swarna Sub-1, IR-28, Pusa-44. Present investigation was carried to study the effect of salinity with 0, 50 and 100 mM concentration of NaCl on germination. The exposure of rice varieties to increasing concentration of NaCl had significantly increased germination (%), seed vigour index. It is evident from the result that concentration with NaCl significantly improved the germination and enzymatic activities of rice genotypes. The concentration are effective in increasing the germination percent. Seed vigour index, radicle length, plumule length, and enzymatic activities like α- amylase, catalase and carbohydrates biochemical parameters like proline accumulation, in all varieties under normal as well as under laboratory condition. The concentration with NaCl 0, 50 and 100 mM influences the germination and biochemical changes under normal as well as under anaerobic condition and might be useful in mitigating the adverse effect of laboratory condition or helpful in increasing the yield and yield attributes in all the varieties. Thus, it may be recommended that salinity level with concentration (0, 50 and 100 mM) of NaCl is the most desirable for mitigating the adverse effect of salinity.

Keywords: Rice, salinity, NaCl, Seed vigor, anaerobic condition

Introduction

Rice (*Oryza sativa* L., 2n= 24), belongs to the family Poaceae (Graminae). Rice is the most important food crop of the developing world and is the staple food of more than half of the world's population. It is especially important crop of Asia, where more than 90% of world rice is grown and consumed and where more than half of world's people live. Rice is the most important cereal food crop of India. It occupies about 23.3% of gross cropped area of the country and plays vital role in the national food grain supply. Rice is rich in nutrients and contains a number of vitamins and minerals. It is an excellent source of complex carbohydrates the best source of energy. It contains a reasonable amount of protein 6-10%, carbohydrate 70-80%, mineral 1.2-2.0% and vitamins (Riboflavin, Thiamine, Niacin and vitamin E). Rice contributes 43% of total food grain production and 46% of the total cereal production of the country. At least 114 countries grow rice and more than 50 have an annual production of 100,000 or more. Asian farmers produce about 90% of the total, with two countries, China and India more than the half. Among the rice growing countries in the world, India has the largest area under rice crop and ranks second in production next to China.

Salinity is a common environmental stress seriously affecting crop growth, food production and crop yield in many regions, particularly in arid and semi-arid regions. It is estimated that over 800 million hectares of land in the world are affected by both salinity and sodicity globally (Munns, 2005) [6]. Salt contaminated soils (ECe> 4 dS m^{-1} or 40 mM NaCl or osmotic potential < 0.117 MPa) are defined as saline land, which directly affects plant growth and development in vegetative growth prior to reproductive stage, especially crop species. Some of crop species are susceptible to salt stress (ECe 1.0-1.8 dS m^{-1}), which decline crop growth and productivity about 6-19% *i.e.* rice, corn, bean, eggplant, onion, potato, pepper, sugarcane and cabbage. In general, biochemical, physiological, anatomical and morphological characteristics

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; SP6-618-621

(Special Issue -6)
3rd National Conference
On
PROMOTING & REINVIGORATING AGRI-HORTI, TECHNOLOGICAL INNOVATIONS
[PRAGATI-2019]
(14-15 December, 2019)

Impact of excess application of growth inhibitor for initiation of seed dormancy in Rice (*Oryza sativa* L.)

Shraddha Singh, AK Singh, Alok Kumar Singh, Preeti Singh and Narendra Pratap Verma

Shraddha Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

AK Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

Alok Kumar Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

Preeti Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

Narendra Pratap Verma
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

Corresponding Author:
Alok Kumar Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, UP, India

Abstract
A field experiment to induce dormancy in rice (*Oryza sativa* L.) was conducted during *Kharif* season, 2017-2018 at the experimental field of Department of Crop Physiology, ANDUA&T, Ayodhya to study the effect of foliar feeding with growth inhibitors by different concentration *viz*. Maleic Hydrazide (500ppm and 1000ppm) and Cycocel (500ppm and 1000ppm) along with untreated control. The experiment was laid out in randomized block design comprising nine treatments at two stages (*viz* flowering stage and anthesis stage) in three replications. Observations had been studied *in vivo* on germination percentage, viability test. Yield characters *i.e.*, number of tillers per plant, ear bearing tillers per plant and biomass per plant, number of seeds per panicle, grain yield per plant and harvest index. Among all the concentrations, maximum number of tillers per plant, ear bearing tillers per plant and number of seeds per panicle was recorded in MH@1000ppm, grain yield per plant and biomass per plant MH@500ppm, harvest index was found maximum in cycocel @500ppm followed by MH@1000ppm where as maximum inhibition of germination was observed with cycocel@1000ppm followed by MH @1000ppm and cycocel @500ppm but cycocel @ 500ppm was found most appropriate and was very much effective for safe induction of seed dormancy in rice because of its minimum viability loss. Loss in viability was may be due to some toxic effect caused by high concentration of MH and cycocel.

Keywords: Cycocel, foliar feeding, induction, maleic hydrazide, rice, seed dormancy, viability

Introduction
Rice (*Oryza sativa* L., 2n= 24), belongs to the family Poaceae (Graminae). It is the most important food crop of the developing world and is the staple food of more than half of the world's population. Rice contributes 43% of total food grain production and 46% of the total cereal production of the country. According to United States Department of Agriculture (USDA) rice production in 2017-2018 is 112.9mt. India stands on rank 1st with respect of area (45.35 ha.) and 2nd in production (112.9 Mt.).

Seed quality has multiple concepts having several components such as genetic purity, Physical Purity, insect-pest, weeds, germination, moisture content, vigour and uniformity. The quality seed is the main and principle mean to secure crop yield in less favorable areas, and this is the main vehicle for rehabilitation in agriculture. The inability of newly harvested seeds to continue their development under favourable environmental conditions like moisture, temperature, oxygen supply is generally known as Dormancy. It is the natural phenomenon in the plant kingdom. It allows plant to survive under unfavorable environmental conditions. It is generally assumed that dormancy is mainly of two types *i.e.* Primary and Secondary types.

International Journal of Chemical Studies 2019; 7(6): 429-432

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(6): 429-432
© 2019 IJCS
Received: 22-09-2019
Accepted: 24-10-2019

Shraddha Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

AK Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Preeti Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Alok Kumar Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Narendra Pratap Verma
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Anubhuti Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Alok Kumar Singh
Department of Crop Physiology, College of Agriculture Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Induction of seed dormancy by foliar spray of growth inhibitors in rice (*Oryza sativa* L.)

Shraddha Singh, AK Singh, Preeti Singh, Alok Kumar Singh, Narendra Pratap Verma and Anubhuti Singh

Abstract
A field experiment was conducted during *Kharif* season, 2017-2018 at the experimental field of Department of Crop Physiology, ANDUA&T, Ayodhya to study the effect of foliar spray of growth inhibitors by different concentration *viz.* Maleic Hydrazide (500ppm and 1000ppm) and Cycocel (500ppm and 1000ppm) along with untreated control to induce dormancy in rice (*Oryza sativa* L.). The experiment was laid out in randomized block design comprising nine treatments at two stages (*viz.* flowering stage and anthesis stage) in three replications. Observations had been studied *in vivo* on germination percentage, viability test and biochemical parameters *viz.* chlorophyll, starch, protein and α-amylase activity. Among all the concentrations, maximum chlorophyll content was recorded in MH@1000ppm was followed by cycocel@500ppm before anthesis stage, maximum protein and starch content was found in cycocel@500ppm before flowering stage but maximum inhibition of germination percentage and α-amylase activity was observed with cycocel@1000ppm before anthesis stage but cycocel @ 500ppm was found most appropriate before anthesis stage which was very much effective for safe induction of seed dormancy in rice because of its minimum viability loss. Loss in viability may be due to some toxic effect caused by high concentration of cycocel.

Keywords: Cycocel, foliar spray, induction, maleic hydrazide, rice, seed dormancy, viability

Introduction
Rice (*Oryza sativa* L., 2n= 24), belongs to the family Poaceae (Graminae). It is the most important food crop of the developing world and is the staple food of more than half of the world's population. Rice contributes 43% of total food grain production and 46% of the total cereal production of the country. According to United States Department of Agriculture (USDA) rice production in 2017-2018 is 112.9mt. India stands on rank 1st with respect of area (45.35 ha.) and 2nd in production (112.9 Mt.).
Seed quality has multiple concepts having several components such as genetic purity, Physical Purity, insect-pest, weeds, germination, moisture content, vigour and uniformity. The quality seed is the main and principle mean to secure crop yield in less favorable areas, and this is the main vehicle for rehabilitation in agriculture. The inability of newly harvested seeds to continue their development under favourable environmental conditions like moisture, temperature, oxygen supply is generally known as Dormancy. It is the natural phenomenon in the plant kingdom. It allows plant to survive under unfavorable environmental conditions. It is generally assumed that dormancy is mainly of two types *i.e.* Primary and Secondary types. The dormancy due to embryo factors or due to seed coat is called as Primary dormancy. The state of dormancy in seed may also be induced due to secondary factors like light, temperature etc. is called as secondary dormancy. Dormancy is a mechanism by which seeds maintain their viability in unfavorable conditions. The characteristics of dormancy may be considered as beneficial in short duration varieties because the crop attains the maturity stage in rainy season itself at that time the proper threshing may not be possible. On the other side it possess cereal problem in testing giving misleading result and require induction of dormancy. Post harvest sprouting is nowadays became a serious problem which adversely affect the quality of seeds and make farmers suffer from great loss. There are many chemicals and plant hormones by which dormancy can be induced.

Materials and Methods
The experiment was carried out under normal field conditions in Kharif season during 2018-19 at crop physiology field of Acharya Narendra deva university of agriculture and technology,

Int.J.Curr.Microbiol.App.Sci (2018) 7(9): 2703-2721

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 09 (2018)**
Journal homepage: http://www.ijcmas.com

Review Article

https://doi.org/10.20546/ijcmas.2018.709.336

Effect of Drought Stress on Crop Plants with Special Reference to Drought Avoidance and Tolerance Mechanisms: A Review

Diganta Deka[1], Anil Kumar Singh[2*] and Alok Kumar Singh[3]

[1]*Tocklai Tea Research Institute, Tea Research Association, Jorhat – 785008 (Assam), India*
[2]*Sri Murli Manohar Town Post Graduate College, Ballia - 277 001, (UP), India*
[3]*Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad - 224 229 (U. P.), India*

**Corresponding author*

Keywords

Crop plants, Drought stress, Drought avoidance, Drought tolerance

Article Info

Accepted:
18 August 2018
Available Online:
10 September 2018

A B S T R A C T

The changes in the climate due to global warming and ever dwindling arable land due to the population pressure are increasing strain on available resources for sustainable food production. Therefore, it is an urgent need to have proper idea about the effect of drought stress on crop plants for getting stable production through research intervention. Water deficit due to drought stress influences a wide range of plant processes, from whole plant growth and development to the molecular regulation of essential transcriptional pathways, and thus significantly impacts both physiology and metabolism. The studies about the changes in behavior of crop plants under drought condition have progressed at a rapid pace and extensive results of such analysis have been made public through various research articles, which can now be easily accessed through the World Wide Web. This review describes some aspects of drought induced effect of drought stress on different important traits of crop plants.

Introduction

The response of plants to drought stress is one of the most complex biological processes, and it involves numerous changes at the physiological, cellular, and molecular levels. Drought is the most frequent yield-reducing factor in arid and semiarid regions, although water deficit may occur even in high rainfall areas. The ultimate detrimental effect of drought stress is reduction in yield, as reported in major crops like rice (Venuprasad *et al.*, 2007), wheat (Keshavarzi *et al.*, 2013), and maize (Kamara *et al.*, 2004) and some other important crops such as soybean (Kobraei *et al.*, 2011) and chickpea (Khodadadi, 2013). Water stress due to drought can lead to major physiological and biochemical changes such as reduced photosynthesis (Zlatev *et al.*, 2004; Tezara *et al.*, 1999) and reprogramming of gene expression (Neill and Burnett, 1999; Pattanagul and Madore, 1999). Physiological changes under drought stress are often reflected at the transcription level, where the levels of mRNA related to key processes such as photosynthesis are down-regulated (Bartels and Salamani, 2001) and mRNA related to

Environment & Ecology 35 (4A) : 2811—2818, October—December 2017
Website: environmentandecology.com ISSN 0970-0420

Biochemical Assimilates Accumulation and Remobilization at Reproduction Stage Drought Stress in Upland Rice (*Oryza sativa* L.)

Alok Kumar Singh, Ashutosh Kumar Mall

Received 22 September 2016 ; Accepted 24 October 2016 ; Published online 12 November 2016

Abstract A very week correlation obtained between leaf rolling score and yield, shoot soluble sugar and RWC, respectively. Leaf depth ; score in well correlated with leaf soluble sugar. Plant height is often considered as a factor in plant response to drought stress. Rice accumulates significant amount of carbohydrate before and wide variability exists among genotypes. Improved variety like NDR-97, Vandana and DH line have higher content of total soluble sugar at flowering than do low yielding traditional cultivar like Azucena and Saita correlation study revealed strong positive relationship between grain yield in stress and shoot soluble sugar. Assimilate accumulated prior to flowering are of paramount importance when plant experience drought at later stage. We hypothesized that grain yields of rice crops drought stressed at flowering, directly related to reserve food materials and the ability of the plant to translocate those assimilate. Translocated-CHO for grain growth is supported by apparent contribution rate (ACR) and value of ACR was higher in stressed plant. This result indicated that under several water deficits at flowering stage, grain growth depend of previously accumulated assimilates. Correlation study showed strong positive regression coefficient (R^2 = 0.54) with grain yield, justified the ability of the plant to translocated assimilate to minimized the sterility due to water deficit. Among the cultivar tested here IR-64, NDR-97, Vandana, Azucena, Moroborokan and DHLs had at par ATR value in irrigated control but generally had more CHO coupled with high ATR and ACR under drought. In present investigation genotypic variability's were observed regarding other stress adoptive plant traits. Higher Nitrate reductase was observed in all genotypes at the end of drought stress and higher correlation coefficient was obtained with grain yield. It seems that higher NR active at the end of drought delayed the leaf senescence, which helps to sustain photosynthesis during stress. Furthermore, linear increase in SOD (antioxidant) was observed after re-watering and stressed plants. The increased in antioxidant activity is believed to be associated with recovery growth.

Keywords Rice, Reproductive stage drought stress, Biochemical assimilates, Soluble sugar, Enzymes.

A. K. Singh
Center of Advance Studies in Plant Physiology, NDUA and T, Kumarganj 224229, India

A. K. Mall*
ICAR-Indian Institute Sugarcane Research, Lucknow 226002, India
e-mail: ashutoshkumarmall@gmail.com
*Correspondence

Introduction

The plant breeding process for drought adaptation can be made more efficient when traits other than yield are added to the selection process. In rice, various researchers have identified putative traits for drought resistance. There has been a large effort to

International Journal of Agriculture Sciences

Research Article

GENETIC EVALUATION AND SELECTION CRITERIA OF UPLAND RICE (*Oryza sativa* L.) FOR PHYSIOLOGICAL TRAITS UNDER REPRODUCTIVE STAGE DROUGHT STRESS

SINGH A.K.[1], SINGH V.N.[1], MALL A.K.[*2], SINGH N.K.[1], DUBEY A.[1] AND SINGH P.K.[1]

1. N. D. University of Agriculture and Technology, Kumarganj, 224 229 (Uttar Pradesh), India
2. ICAR-Indian Institute of Sugarcane Research, Lucknow, 226 002 (Uttar Pradesh), India
*Corresponding Author: Email-Ashutosh.Mall@icar.gov.in

Received: May 16, 2017 Revised: June 06, 2017 Accepted: June 07, 2017 Published: June 30, 2017

Abstract The present investigation attempt has been made to combine different type of germplasm in order to identifying the physiological basis of genetic variation in drought tolerance. The High estimates of PCV and GCV were observed for sterile grains per panicle, root dry weight, root volume, root length and fertile grains per panicle under both the conditions. High estimates of heritability and genetic advance were recorded for water potential, fertile grains panicle^{-1}, sterile grains panicle^{-1}, straw yield, total biomass at flowering, total biomass at maturity, ACR, root length, root volume and grain yield under both the conditions. Thus, selection practiced for these characters in plant materials under study may be expected to be highly fruitful for isolating high yielding genotypes for irrigated/drought environments. The other traits would be unreliable indices for improvement through selection due to existence of low to moderate transmissibility along with low variability. None of the morpho-physiological traits appeared as strong associates of grain yield in irrigated control condition, whereas four traits, namely, straw yield, panicle length, total biomass at maturity and total biomass at flowering were found to be strong associates of grain yield in water stress condition. In over all consideration, soluble sugar upper root and starch at re-watering in control condition and starch in leaf, starch at re-watering and chlorophyll a in stress condition emerged as most important direct yield components owing to their high order positive direct effects at phenotypic as well as genotypic level.

Keywords Upland rice, drought, physiological traits, direct and indirect selection parameters

Citation Singh A.K., et al. (2017). Genetic Evaluation and Selection Criteria of Upland Rice (*Oryza sativa* L.) for Physiological Traits under Reproductive Stage Drought Stress. International Journal of Agriculture Sciences. ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 9, Issue 30, pp.-4438-4445.

Copyright Copyright©2017 Singh A.K., et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

Drought stress at either vegetative or reproductive stages of plant growth is the major constraint to rice production and yield stability in the rainfed upland regions [1]. Most of the farmers in India usually grow local varieties in upland rice under diverse agro climatic conditions. Even though these varieties are well adapted to the local conditions, they are poor yielders. Therefore, stable genotypes which perform better under stress as well as under favorable condition are desirable in target environment for sustainable rice production. Short duration varieties with tolerance to drought suit drought prone upland ecology.

The direct selection parameters help us in developing suitable selection strategy for enhancing the effectiveness and efficiency of selection in improving plant characters. The literature pertaining to assessment and comparison of direct and indirect selection parameters in rice drought condition is meager. Most of the earlier reports in respect of above aspects in rice are based on studies involving either irrigated or drought environments so such studies fail to provide finer understanding and comparison of genetic parameters in relation to water stress and stress free conditions. Moreover, the results of the earlier studies on such aspects are relevant only for materials and environments involved in particular study and cannot be generalized. The results of character association studies in rice by earlier workers have been found to be non-consistent varying with the materials and environment used [2 & 3]. Further probe in this respect in rice might prove useful due to non-consistent findings reported earlier. Therefore, studies on above aspects in rice involving genetic stocks and environments in question are essential for obtaining information required for planning and execution of a successful breeding programme aimed at development of superior varieties for irrigated and drought prone environments.

Materials and Methods

The present investigation was carried out in wet season at the Instructional Farm of Department of Crop Physiology, N. D. University of Agriculture & Technology, Kumarganj (Faizabad), U.P., India. The genotypes of upland rice from different geographical regions were screened for reproductive stage drought tolerance. The genotypes were seeded and seedling establishment was done in dry beds and transplanting was done 21 days after seeding. Each genotype was transplanted in Randomized Block Design with three replications in a 5 m length row. Row spacing was 20 x 15 cm and one seedling per hill was used. Recommended agronomic practices were followed. Pesticides and bird nets were used to protect the plants against pests. All other crop management practices were at the optimum level.

Management of water stress

The experiments were conducted with well defined protocol for water management under natural field conditions during wet season in both the years.

Irrigated (NS): The experimental field was left uncovered to receive natural rainfall. In addition to this, experimental plots were irrigated using well laid channels for supplying tube well water, as and when required, to maintain appropriate moisture levels as recommended for irrigated rice.

International Journal of Agriculture Sciences

Research Article

GENETIC VARIABILITY IN RAIN-FED LOWLAND RICE BREEDING POPULATION UNDER NORMAL AND DELAYED TRANSPLANTING CONDITIONS

SINGH N.K.[1], SINGH A.K.[2] AND MALL A.K.[3]*

[1]Department of Genetics and Plant Breeding, Narendra Dev University of Agriculture and Technology, Kumarganj, 224 229, Faizabad, Uttar Pradesh
[2]Centre of Advance Studies in Plant Physiology, Narendra Dev University of Agriculture and Technology, Kumarganj, 224 229, Faizabad, Uttar Pradesh
[3]ICAR-Indian Institute of Sugarcane Research, Lucknow, 226 002, Uttar Pradesh
*Corresponding Author: Email-Ashutosh.Mall@icar.gov.in

Received: May 16, 2017, Revised: June 06, 2017, Accepted: June 07, 2017, Published: June 30, 2017

Abstract- The importance of additive gene effects for most of the nine traits in the three crosses under two transplanting conditions suggested substantial scope of improvement in yield status can still be achieved by using breeding procedures. GY/P, BY/P and PH possessed high heritability and genetic advance in both conditions and emerged as ideal traits for selection. G/P, T/P and DFF in E1 and HI in E2 appeared also as ideal traits for selection owing to their high estimates for both parameters in respective conditions. At both levels, positive correlation of GY/P was recorded with HI in both transplanting conditions. BY/P, PL in both transplanting conditions and T/P and G/P in E1 appeared as strong positive associates of GY/P at both levels. Path analysis identified BY/P and HI as most important direct components and PL and G/P as most important indirect components of GY/P in both conditions. These characters merit due to consideration in formulating effective selection strategy in rainfed lowland rice for developing high yielding varieties for normal and delayed transplanting.

Keywords- Rice, normal and delay transplanting, GCV, PCV, correlation, direct and indirect effects

Citation: Singh N. K.., et al., (2017) Genetic Variability in Rain-fed Lowland Rice Breeding Population under Normal and Delayed Transplanting Conditions. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 9, Issue 30, pp.-4431-4434.

Copyright: Copyright©2017 Singh N. K.., et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Senthil Kumar M.

Introduction

Rainfed lowland rice is a dominant rice culture in countries that form a belt from India to Cambodia. Barker et al. [1] found that research in rainfed lowland rice would produce higher rates of return than research on irrigated rice. At present, however, most research is directed to irrigate environments, even in countries where rainfed rice predominates. The research investment was lower in countries with a high proportion of rainfed rice compared to countries with predominantly irrigated rice [1].

Various agronomic and morphological characters, photoperiod sensitivity is another highly important and desirable feature of all rainfed lowland rice. According to Pushpavesa and Jackson [2], the photoperiod sensitivity provides adaptive advantages of tolerance to late transplanting and a dependable maturity date after the rainy season ends. Transplanting is the most widely used method by which rainfed lowland rice crops are established because it allows farmers to be flexible in dealing with water related stresses. In rainfed lowlands, drought or flooding often makes it impossible to transplant 3-4 week old seedlings which most agronomists consider as the optimum age for transplanting [3]. In fact, in more than 50 per cent of rainfed lowland rice area, transplanting is frequently delayed [4]. If drought occurs just after seeding due to delayed rains, the plants can be maintained in the seedbed until sufficient water in available for transplanting and subsequent growth. In medium deep area, farmers have to transplant older seedlings to escape or survive flood damage. The photoperiod sensitive cultivars are suitable for delayed transplanting because by virtue of having constant maturity date such cultivars are usually harvested before conditions become too dry. By contrast, photoperiod insensitive cultivars flower and ripen late on late transplanting which increases the chance that crop will fail due to drought. Thus, genetic studies in rainfed lowland rice and subsequent breeding efforts must be planned after taking into consideration photoperiod sensitivity and delayed transplanting aspects of this rice culture.

So far, rainfed lowland rice has got very little attention of rice breeders as compared to irrigated rice in India as well as abroad. The high yielding cultivars of irrigated rice often perform below satisfactory levels in adverse and diverse rainfed lowland conditions because different agronomic traits and plant type are needed for each type of rice cultures [5]. To understand of direct and indirect selection parameters also helps in effective application of selection in isolating superior genotypes for a particular environment or situation. However, very little literature is available in respect of gene effects and direct and indirect selection parameters in rainfed lowland rice, especially under delayed transplanting conditions. Keeping in view these facts, the present investigation was undertaken on rainfed lowland rice under normal and delayed transplanting conditions.

Materials and Methods

The investigation was conducted at Crop Research Station, Masodha, Faizabad (U.P.) during *Khanf* season. The site falls under sub tropical to semi arid region in Indo-Gangatic plains and lies between 26.47°N latitude, 82.12°E longitude and at an altitude of about 113 m above mean sea level.

Experimental Details

The two cytoplasmic male sterile (CMS) lines *viz.*, IR-58025-A and NDMS-4-A possessing Wild Abortive (WA) type of cytoplasm, were crossed with thirty genetically diverse pollen parents *viz.*, NDRSB-96006-R, NDRSB-9730015-R, NDRSB-9830099-R, OR-1537-15-R, OR-1543-11R, OR-1547-9-1-R, OR-1564-5

Journal of Agricultural Science and Technology B 12 (2022) 1-15
doi: 10.17265/2161-6264/2022.01.001

Impact of Climate Change on Diseases of Crops and Their Management—A Review

Manish Kumar Maurya[1], Vikash Kumar Yadav[1], Sumant Pratap Singh[2], Rajender Jatoth[3], Hemant Kumar Singh[1] and Dinesh Singh[3]

1. Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224229 (U.P.), India

2. Department of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224229 (U.P.), India

3. Division of Plant Pathology, ICAR- Indian Agricultural Research Institute, New Delhi, 110012 India

Abstract: Change in global climate is primarily due to rising concentrations of greenhouse gases in the atmosphere that is mostly caused by human activities. The important factors affecting the occurrence and spread of the plant diseases are temperature, moisture, light, and CO_2 concentration. These factors cause physiological changes in plants that result in increase in intensity of crop diseases. Climate change causes a significant impact on germination, reproduction, sporulation and spore dispersal of pathogens. Climate change affects all life stages of the pathogen as well as its host to cause impact on host-pathogen interaction which facilitates the emergence of new races of the pathogen ultimately breakdowns the host resistance. It also affects the microbial community in the soil which is beneficial to the plants in various aspects. The minor diseases become major ones due to alteration in climatic parameters thus posing a threat to the food security.

Key words: Climate change, greenhouse gases, temperature, elevated CO_2, pathogens, sporulation.

1. Introduction

Climate change is a long-term shift in the statistics of the weather. Worldwide climate change is a major concern of discussion within both scientific and political forums. According to World Meteorological Organization (WMO) the decade (2010-2020) is the warmest decade on record. Changes in climate are still going unstopped and temperature is projected to increase by 3.4 °C and CO_2 concentration to 1,250 ppm by 2095, along with much greater variability in climate and more extreme weather-related events [1] accompanied by more climatic variability and adverse weather events [2]. In India, it is likely to experience a temperature rise of 1-4 °C; rainfall will increase by 9%-16% by 2050. This change in the earth's atmospheric composition is mostly due to the unscrupulous activities of the human beings. The changes in the earth's climate are the result of changes in the cryosphere, biosphere, hydrosphere, and other interacting factors. Greenhouse gases like water vapor (H_2O), methane (CH_4), carbon dioxide (CO_2), nitrous oxide (N_2O), hydrofluorocarbons (HFCs) and ozone (O_3) present in the earth's atmosphere trap the reflected radiation; and in turn warm the earth surface [3]. Biological processes are strongly influenced by temperature and water availability. Climate change is affecting all the four pillars of food security: availability (yield and production), access (prices and ability to obtain food), utilization (nutrition and cooking), and stability (disruptions to availability) [4].

Many environmental factors affect plant disease development viz., temperature, light and water availability, soil fertility, wind speeds, and atmospheric ozone, methane and CO_2 concentrations. Among these, three factors viz., CO_2 concentration,

Corresponding author: Dinesh Singh, Ph.D., research field: plant bacteriology.

International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 7, 2022, pp.-11447-11453.
Available online at https://bioinfopublication.org/pages/jouarchive.php?id=BPJ0000217

Research Article

SCREENING OF DIFFERENT CULTIVAR OF INDIAN MUSTARD FOR PARTIAL RESISTANCE TO *ALTERNARIA BLIGHT*

PANDEY M.K.[1]*, SINGH H.K.[1], PATHAK M.K.[2] AND GUPTA P.K.[3]

[1]Department of Plant Pathology, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya, 224229, Uttar Pradesh, India
[2]Regional Research Station, Karnal, 126102, Haryana, National Horticulture Research and Development Foundation, New Delhi, 110 058, India
[3]National Horticulture Research and Development Foundation, New Delhi, 110 058, India
*Corresponding Author: Email - manojpandeysln@gmail.com

Received: July 03, 2022; Revised: July 26, 2022; Accepted: July 27, 2022; Published: July 30, 2022

Abstract: Partial resistance to *Alternaria blight* (*Alternaria brassicae*) was assessed in 15 genotypes of Indian mustard under field conditions. four genotypes viz., NDRE-7, NDWR-05-1, NDRE-4 and NDRE-16 exhibited partial resistance and had lowest per cent blight cover, minimum number of spot/ 10 cm^2, size of spot (mm), sporulation (conidia/spot), disease severity (PDI), apparent infection rate, leaf defoliation, AUDPC and maximum yield, respectively. Numbers of spot were positively & significantly correlated with size of spot (0.949), disease index (0.905), leaf defoliation (0.954), AUDPC (0.917), infection rate (0.878), except sporulation and negatively correlated with yield kg/ha (-0.952).

Keywords: *Mastard, Alternaria, AUDPC, Brassica, Genotype*

Citation: Pandey M.K., *et al.*, (2022) Screening of Different cultivar of Indian Mustard for Partial Resistance to *Alternaria blight*. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 7, pp.- 11447-11453.

Copyright: Copyright©2022 Pandey M.K., *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr N Umashankar Kumar

Introduction

Oilseed crops play an important role in agricultural economy of India. Our country is the fourth largest oil economy in the world after the U.S., China and Brazil in terms of vegetable oils. Out of annual commercial cultivation of 7 edible oilseeds (groundnut, rapeseed-mustard, sesame, linseed, soybean, safflower and niger) in India, rapeseed-mustard (Brassica species.) contributes 28.6% in the total production of oilseeds. The edible oil industry is one of the most vibrant sectors of the Indian agriculture economy. The county ranks first in the world in the production of castor, safflower, sesame and niger; second in groundnut and rapeseed-mustard; third in linseed and fourth in soybean.

The cultivation of oilseed crops along with many other minor oilseed crops has been possible due to favorable agro ecological conditions. Rapeseed and mustard belongs to family Brassicaceae which is grown in Northern India comprising traditionally grown indigenous species namely Indian mustard (*Brassica juncea*), brown sarson(*Brassica campestris* var. brownsarson), yellow sarson (*Brassica campestris* var. yellow sarson) toria (*Brassica campestris* var. toria) and Taramira (*Eruca sativa*) along with nontraditional species like gobhisarson (*Brassica napus*), white mustard (*Brassica alba*) and Ethiopian mustard (*Brassica carinata*). It is the most important group of rabi oilseed crops and contributes a major share to the vegetable fat economy of the country.

Rapeseed-mustard oil is the cooking medium and dietary fat of a very large population in northern and eastern states in our country. Rapeseed-mustard oil is characterized by a low level of saturated fatty acids, a relatively high level of mono unsaturated fatty acids, moderate level of polyunsaturated fatty acids and an appreciable amount of the α-linolenic fatty acid. The content of saturated fatty acids, which are known to increase cholesterol levels (viz., Lauric, Myristic and Palmitic), is only 4%. Higher levels of monounsaturated and polyunsaturated fatty acids provide the advantage on lowering total cholesterol of plasma and low-density lipoproteins (LDL) cholesterol as well as protective against oxidation of LDL.

The fairly high level of phyto-sterols present in the oil are also reported to lower plasma cholesterol level of absorption of dietary cholesterol and the reabsorption of billary cholesterol. Oil and meal quality have an important place in rapeseed-mustard breeding programme. Quality of oil is important for good health of human being (nutrition point of view, keeping quality (shelf life of oil) and industrial uses. Oil quality and usage of oil, by and large, is determined by the proportion (percentage) of various fatty acids present in oil. Meal quality is determined by levels of anti-nutritional factors particularly by glucosinolate and proportional protein and fiber contents. Canola is a registered name given by Western Canadian Oilseed Crusher's Association for varieties having less than 2 per cent erucic acid in oil and less than 22 μ moles of glucosinolate/g in defatted seed meal. Indian cultivars have high erucic acid (40-50%) in oil and high glucosinolate (80-120 μ moles/g) in seed meal. So there is an urgent need to make concerted efforts for breeding varieties with improved quality of oil (< 2% erucic acid) and meal (≤ 22 μ moles/g glucosinolate) at par with international quality norms. Edible oils or fats are associated with an increased risk of heart diseases, so major emphasis should be given on quality of oil and fat, which are very high in polyunsaturated fatty acids (PUFA). PUFA causes Atherosclerosis' a disease in adults and uipidosis in children, which interferes in myocardial conductance and peripheral vascular system, thereby decreasing coagulation time and increases blood cholesterol. Concentrated scientific approach for the improvement of quality of oil is the need of the hour. Among oilseed crops, rapeseed-mustard occupies a prominent position in the country. Rapeseed-mustard are major rabi oilseed crops of the northern India. The oilseed crop is predominantly cultivated in Assam, Bihar, U.P, W.B, Rajasthan and North Eastern states particularly Meghalaya & Sikkim, (North & Central India) India occupies the second position in area after China and third position in production of rapeseed-mustard in the world after China and Canada. In India, it is the second most important edible oilseed crop after groundnut sharing 25-30.0% in the India's oilseed economy.

Journal of AgriSearch, 9 (1): 79-87
An Open Access International Peer Reviewed Quarterly

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v9i01.9899

39

Varietal Screening and Molecular Analysis against Alternaria Blight in Indian Mustard Genotypes

SAMRIDDHI SINGH[1], NA KHAN[1], SUMANT PRATAP SINGH[1], HK SINGH[2] AND DK DWIVEDI[1]

ABSTRACT

Indian mustard [Brassica juncea (L.) Czern & Coss] is an important edible oilseed crop in India. There are 154 genotypes screened under natural condition against Alternaria blight. Disease appeared on leaves after 90 days were noted as, 9 genotypes found moderately susceptible (Rohini, PAB-14-14, PBZ-4, PRD-14-1, PAB-14-5, PRD-14-16, PAB- 14-17, PHR-2, Parvati), 29 were susceptible and 116 were highly susceptible. In case of biochemical analysis, only ten genotypes, maximum phenolic value in non-infected and infected leaves was in found same variety NDRS-2009-1 and peroxidase activity maximum values was found non-infected and infected leaves NDRE-1-11-1, Vaibhav. In catalase activity, a height value was found non-infected and infected leaves varieties NDRS-2007, NDRS-2009-1. Cluster analysis dendogram is divided in two group I and II, this similarity showing mean 0.45 and group I had only one variety namely NDRS-2009- 1. Group II had divided in to two sub groups A and B. Group A is in to two clusters A1 and A2 in this group similarly 0.60 and cluster A1 divided in to two sub cluster A1-1 and A1-2, sub cluster A1-1 had found three varieties NDRE-1-11-1, NDYR-2008 and Narendra Rai but NDRE-1-11-1 0.75 more similar both varieties NDYR-2008 and Narendra Rai. Sub cluster A1-2 had two varieties Vaibhav and Rohini both similar only 0.70. Cluster A2 had found three varieties NDRE -7, Vardan and PM-26 but both NDRE -7, Vardan dissimilar 0.81 then PM-26 and group B had found only one variety NDRS-2007.

ARTICLE INFO

Received on	:	09.01.2022
Accepted on	:	27.02.2022
Published online	:	16.03.2022

Keywords:
Brassica juncea, Catalase, Peroxidase, Phenol, Alternaria blight.

CC BY SA

INTRODUCTION

Indian mustard [*Brassica juncea* (L.) Czern & Coss.] is an important edible oilseed crop in India, it is commonly referred to as rapeseed mustard along with four other related cultivated oilseed species viz. *B. rapa, B. napus, B. carinata* and *Eruca sativa*. Oilseed brassica shares 23.5% area and 24.2% production of total oilseeds in the country. Indian mustard is belonging to Brssicacea family. In this three diploid species, namely, *Brassica rapa* (AA, 2n=20), *Brassica nigra* (BB, 2n=16), *Brassica oleracea* (CC, 2n=18), and their three natural amphidiploid species, namely, *Brassica napus* (AACC, 2n=38), *Brassica juncea* (AABB, 2n=36) and *Brassica carinata* (BBCC, 2n=34), constitute cultivated Brassicas. These are cultivated across the globe for use as vegetables, oilseed crops and condiments (Maheshwari and Kovalchuk, 2016).

The estimated area, production and yield of rapeseed-mustard in the world was 36.59 million hectare (mha), 72.37 million tonne and 1980 kg /ha, respectively, during 2018-19. Globally, India accounts for 19.8% and 9.8% of total acreage and productivity (USDA). During 2018-19 the production was 1980 kg/ha and production 72.42 mt (DRMR, 2018-19). In Uttar Pradesh, Rapeseed – mustard was grown on 1099 ha with a production of 8041 tonnes and 1054 kg/ha productivity during 2017-18 (Anonymous, 2018).

Disease resistance depends upon the induction of defenses following exposure to organisms. Several types of biochemical changes which include the level of phenolics was found to be important in the investigation of resistance mechanism (Arora and Wagle, 1985; Meena *et al.*, 2008). The aim of this research was to explore the possibility of biochemical changes for defense and symptom logical changes in the three genotypes of oilseeds *Brassica* infected by *A. brassicae* under natural conditions at different stages of Alternaria blight disease development. *Alternaria* infection causes considerable changes in the sugar and phenolic contents of the plant (Chopra and Jhooty, 1974; Nema, 1983; Chahal, 1986; Kumar and Singh, 1996; Saharan and Saharan, 2004; Joshi *et al.*, 2004; Kushwaha and Narain, 2005). The biochemical and physiological changes associated with induction of resistance and plants peroxidases have been implicated in varieties of defense-related processes, including the hypersensitive response, lignifications, cross-linking of phenolics and glycoprotein, suberization and phytoalexin production. (Rakow and Raney, 2003). Catalase is frequently used by cells to rapidly catalyze the decomposition of hydrogen peroxide into less reactive gaseous oxygen a water molecule thus avoiding cellular disintegration (Bolwell and Wojtaszek, 1997). Peroxidase convert H_2O_2 to water provide an efficient system to prevent oxidative damage. Induction and accumulation of POX correlated with onset of induced resistance suggest an active role for this enzyme in defense against pathogenic fungi and retard fungal growth (Jung *et al.*, 2004).

MATERIALS AND METHODS

The experiment was conducted at the Student's Instruction Farm, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *Rabi* 2019-20. The planting of 154 Indian mustard genotypes were done

[1] Deptt. of Plant Molecular Biology and Genetic Engineering, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya- 224229 (U.P.) India
[2] Deptt. of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya- 224229 (U.P.) India
Corresponding Author E-mail: sumantso05@gmail.com

The Pharma Innovation Journal 2021; 10(8): 995-997

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(8): 995-997
© 2021 TPI
www.thepharmajournal.com
Received: 16-06-2021
Accepted: 22-07-2021

Satya Prakash Vishwakarma
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

HK Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar Maurya
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Kumar Yadav
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Krishna Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shyam Babu Gautam
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajendra Prashad
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Satya Prakash Vishwakarma
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

In vitro efficacy of fungicides against *Myrothecium roridum* causing leaf spot of Bael

Satya Prakash Vishwakarma, HK Singh, Manish Kumar Maurya, Vikash Kumar Yadav, Krishna Kumar, Shyam Babu Gautam and Rajendra Prashad

Abstract
Leaf blight caused by *Myrothecium roridum* is a devastating disease of Bael in nursery stage. The experiments were conducted to test the efficacy of fungicides against *Myrothecium roridum* causing leaf spot of bael in *in vitro* condition. The results showed that the complete (100%) mycelial growth inhibition was recorded with Tebuconazole (50%) + Trifloxystrobin (25%) 75 WP @ 0.05%, Carbendazim (12%) + Mancozeb (63%) @ 0.2%, Propiconazole (25%) EC @ 0.1%, Tebuconazole (25%) EC @ 0.2% and Carbendazim 50% WP @ 0.1%. The minimum mycelial growth (mm) and maximum growth inhibition at 24 day after inoculation was Hexaconazole (5%) EC @ 0.1% (39.66mm and 55.93%) followed by Mancozeb (75%) WP @ 0.2% (45.66mm and 49.26%) and Azoxystrobin (18.2%) + Difenconazole 11.4% SC @ 0.2% (50.33mm and 44.07%). Maximum mycelial growth was found in control (90.00).

Keywords: Bael, *Myrothecium roridum, in vitro*, efficacy, fungicides

1. Introduction
Bael (*Aegle marmelos* Correa) is an indigenous fruit of India belongs to family Rutaceae, chromosome number is 2n = 18(36) and it is commonly known as Bengal queen, Golden apple, Japanese bitter orange, Stone apple, Wood apple (John and Stevenson, 1979) [1]. Nevertheless, the Bael tree grows in almost all the states of India; however, it is widely distributed in U.P., Bihar, West Bengal, Orissa and Madhya Pradesh (Roy *et al.*, 1992) [6].
Bael plants are widely and abundantly grown in eastern Uttar Pradesh particularly in Mirzapur, Varanasi, Gorakhpur, Basti, Gonda, Ayodhya, Etawah districts and also Sewan district of Bihar (Teaotia *et al.*, 1963) [8]. The average height of tree, 8.5 meters. Flowers, greenish white, sweetly scented, 8 mm long; diameter of a fully open flower, Fruits, yellowish green, with small dots on the outer surface, The flowering was observed to the second fortnight of June to the first fortnight of July. The fruits take almost one year to mature. The peak fruiting season is during May and June. The average yield of a wild Bael tree was 62.5 kg. (Parmer and Kaushal, 1982) [4].
In the ancient medical Ayurvedic treatise `Charaka Samhita` every part of this tree, stem, bark, root, leaves and fruit at all stages of maturity have medicinal merits and have been used as remedy for a long time. It cleanses and strengthens the intestines. Its ripe fruits flesh used for syrups or can be eaten both fresh and dried. Bael tree is considered a sacred tree, commonly grown in temple gardens in the country. It is important indigenous fruit of India. The fruit is known to possess significant therapeutic and medicinal value and is widely used in Homeopathy and Ayurveda. Bael is the most effective herbal remedy for diarrhea and dysentery. Anti-diarrheatic activity of Bael root (Pitre and Srivastava, 1984).
Bael plant is affected by fungal diseases is very serious in nursery condition like Alternaria leaf spot disease caused by *Myrothecium roridum*. The symptoms were found on leaves as small, circular or irregular in shape, brown in colour and chlorosis around the lesions were observed but later on these spots enlarges and covered the more area. Disease symptoms recorded first in rainy season (July-August) as circular brown spots on the upper surface of the leaf. The older leaf spots (15-20 days after formation of new spots) frequently exhibited concentric rings along with sporodochia arranged in a somewhat concentric pattern. At advanced stage of disease development a characteristics shot hole in the leaves were seen due to shedding of necrotic tissues.

Journal of AgriSearch, 8 (3): 241-248
An Open Access International Peer Reviewed Quarterly

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v8i03.1669

37

Yield Loss Assessment due to Alternaria Blight Disease in Rapeseed and Mustard

H K SINGH[1*], PRADIP KUMAR[1] AND S K SINGH[2]

ABSTRACT

An experiment was conducted to assess the yield losses due to Alternaria blight in different released cultivars of rapeseed-mustard during Rabi 2016-17 and 2017-18 planting 15 varieties of the rapeseed-mustard namely RH-749, Pusa gold, KBS-3, GSL-5, GSL-2, Pusa mustard-27, Jhumka, Anuradha, PT-30, T-27, PM-25, Pusa aditya, PT-303, Sheetal, TMLC-2 in six replications. The minimum disease severity on leaves and pods were recorded in protected and unprotected conditions in the variety GSL-5 (2.65% and 16.26%), (1.75% and 6.32%) followed by GSL-2 (3.20% and 19.72%), (1.89% and 6.75%) Pusa aditya (6.91% and 19.89%), (2.18% and 7.20%) and Sheetal (7.99% and 23.13%), (3.21% and 7.43%), respectively. On the basis of mean values the minimum infection rate on pods was recorded GSL-2 (0.083 and 0.042) followed by Pusa aditya (0.089 and 0.045), respectively. The minimum AUDPC on leaf under protected and unprotected was recorded on cultivar GSL-5 (76.40 and 496.20) followed by GSL-2 (88.80 and 596.85), Pusa aditya (205.35 and 588.25), Sheetal (241.70 and 717.30) and RH-749 (244.95 and 950.85), respectively. Whereas the minimum AUDPC on pod was recorded with variety GSL-5 (32.10) and Pusa aditya (200.25) followed by [GSL-2 (34.65) and Sheetal (206.65)], [Pusa aditya (39.35) and RH-749 (566.41)] and [Sheetal (60.95) and Pusa mustard-27 (741.75)], respectively. The maximum yield avoidable loss (%) was recorded T-27 (46.67%) followed by Jhumka (44.53%, Anuradha (40.00%), KBS-3 (38.77%) and Pusa gold (34.13%), respectively. Minimum avoidable loss (%) was recorded on cultivar GSL-5 (11.09%) followed by Anuradha (14.36%), GSL-2 (17.73%), RH-749 (17.90%) and Pusa aditya, respectively. In present investigation out of 15 genotypes examined for blight resistance, GSL-5, Pusa Aditya, Sheetal and GSL-2 exhibited good level of partial resistance i.e. moderately resistance. Other 11 varieties RH-749, Pusa gold, Pusa mustard-27, Jhumka, Anuradha, PT-30, PT-303, T-27, KBS-3, TMLC-2 and PM-25 were susceptible based on the mean basis severity (PDI), reduced apparent infection rate and lesser value of AUDPC.

KEYWORDS

Rapeseedmustard, variety, yield loss, fungicides, Alternaria brassicae

ARTICLE INFO

Received on	:	12/04/2021
Accepted on	:	05/07/2021
Published online	:	05/09/2021

CC BY SA

INTRODUCTION

Rapeseed-mustard is one of the major oilseed crops cultivated in India and around the world. It is extensively grown traditionally as a pure crop as well as intercrop (mixed crop) in marginal and sub-marginal soils in the eastern, northern and north-western States of India (Singh *et al*, 2017). Rapeseed and mustard belong to family Brassicaceae, Indian mustard commonly known as *rai* is the most important member of Cruciferous oil seeds occupying nearly 70 per cent of the total area under rapeseed-mustard (Singh *et al*, 2014b). The leaves of young plants are used as green vegetable and whole plants as green fodder. The seeds are highly nutritive containing 38 to 57 per cent erucic acid, 4.7 to 13 per cent linoleic acid and 27 per cent oleic acid (Singh *et al*, 2011). The rapeseed and mustard group dominates among oilseed crops in area and production on global level. India is one of the largest rapeseed-mustard growing countries in the world, occupying the third position in area and production after China and Canada sharing 12 per cent of world's total production. At global level, rapeseed-mustard is cultivated on 5.96 million hectares with production of 8.32 million tonnes and productivity of 1397 kg/ha (Anonymous, 2018). Rapeseed-mustard is the second most important oilseed crop after groundnut and accounts for nearly 30.7 per cent of the total oilseed production in the country. There are several diseases known to affect the mustard crop but foliar diseases like Alternaria leaf spot, white rust (blister), downy and powdery mildews cause heavy yield losses to the crop. Alternaria blight caused by Alternaria brassicae (Berk.) Sacc and Alternaria brassicicola (Schw) Wiltshere is a worldwidely distributed and economically important disease on rapeseed (Brassica napus), mustard (Brassica campestris) and other brassicas (Singh *et al*, 2014a), Tewari and Conn (1993) , Kumar (1997), Meah *et al* (2002), Meena *et al* (2010). The characteristic symptom is the development of circular spots on leaves and pods with concentric ring. Later on spots coa-

[1] Department of Plant Pathology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Uttar Pradesh 224 229, India
[2] Crop Research Station, Bahraich, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Uttar Pradesh 224 229, India
*Corresponding author email: hksndu@gmail.com

Journal of AgriSearch, 8 (2): 108-111
An Open Access International Peer Reviewed Quarterly

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v8i2.7292

(36)

First Report of Fusarium pallidoroseum (Cooke) Sacc. on Bael (Aegle marmelos Correa) causing Leaf Spot and Die Back Disease in Nursery

SANTOSH KUMAR, H K SINGH* AND SANJEEV KUMAR

ABSTRACT

Bael is a very popular indigenous fruit of India. Cultivation of bael is a lucrative venture because of its high pharmaceutical importance. The deciduous tree with trifoliate aromatic leaves offering of bael leaves is a compulsory ritual of the worship of lord shiva. In bael nursery, disease appeared during post rainy season (September) as irregular pustules, which was brown in colour, increases very fast and covers the most of the leaf area. After severe infection, affected leaves become dry and fall off. The disease progresses downward causing dieback symptoms but roots remain healthy and they produces new shoots after destroying the vegetative parts. This type of symptoms incited by Fusarium pallidoroseum (Cooke) Sacc. was identified as a causal organism. The pathogenicity test of the fungus was established. Fusarium pallidoroseum produce smooth and creamy white colony, grew rapidly on PDA medium at 25°C to 26°C and produced rose pink colored woolly to cottony, flat spreading colonies when mature. The mass of the mycelium was very compact in nature. The fungus produced both macro and micro conidia, which are hyaline, septate and ends are also hook shaped. Mycelia are thin and septate. Macro conidia were produced from phialides on unbranched or branched conidiophores. Macro conidia born in sporodochia were curved, possess a foot cell, 3-5 septate. Micro conidia are single celled, smooth, hyaline, ovoid to cylindrical.

KEYWORDS

Aegle marmelos, Fusarium pallidoroseum, leaf spot, dieback

ARTICLE INFO

Received on	:	18/04/21
Accepted on	:	23/06/21
Published online	:	30/06/21

CC BY SA

INTRODUCTION

Bael (Aegle marmelos L. Correa) is one of the most utilitarian medicinal plants of India; it grows under adverse agro-climatic conditions. It is known by different names in different parts like Bengal quince, golden apple, stone apple, Bael and Sirphal maredu (Andhra Pradesh), bael (Bengal), bil (Gujarat), bil (Himachal Pradesh), bael (Hindi), bilpatra, kumbala, malura (Karnataka), vilwam (Kerala), bilwa (Sanskrit), kuvalum (Tamil Nadu). The deciduous tree with trifoliate aromatic leaves offering of bael leaves is a compulsory ritual of the worship of lord shiva. It has capacity to adapt successfully to a wide range of habitat from arid, semiarid to mesophytic conditions and a wide temperature tolerance (from -7°C to 48°C). The ripen bael fruits are popular among people because of the delicious fruit pulp, which is ideal for making jam, syrup and pudding. Bael possesses many medicinal values and theretore used as an ingredient in ayurvedic herbal medical preparations. The fruits, bark, leaves, seeds and roots of bael contain bioactive compounds such as coumarin, xanthotoxol, imperatorin, aegelineand marmeline. These compounds can provide anticancerous, antidiabetic, antimicrobial, antifertility, immunogenic and insecticidal activities. Bael is also essential as a species for reforestation, especially in the unfertile marginal lands. Bael seeds possess a unique fatty acid (12 hydroxyoctadeccis 9-enoic acid or ricinoleic acid) a convertible item into biodiesel (Pathirana *et al*, 2020). The importance of bael lies in its curative properties, make the tree one of the most useful medicinal plant of India. Disease causing agents have potential to imapare the quality of economic produces, and needs time and energy to for its effective management (Singh *et al*, 2013). Bael nursery plants suffer from a number of fungal foliar diseases namely root rot, collar rot and wilt caused by F. solani, leaf spot caused by Myrothecium roridum and Alternaria alternata (Anonymous, 2019).

MATERIALS AND METHODS

The field experiment was conducted at Main Experiment Station, Horticulture situated at main campus of Narendra Deva University of Agriculture and Technology, Kumargani, Faizabad (U.P.). This centre is situated between 26.47° N latitude to 82.12° E longitude and at an altitude of 113 m above mean sea level on Faizabad-Raibarelly road about 42 Km away from Faizabad city. The location falls under Indo-Gangatic plains of Eastern Utter Pradesh of North-India.

Isolation of pathogen

The diseased leaves were collected from the nursery of bael seedling showing distinct characteristics of symptoms, selected for the isolation of the pathogen. The leaves were washed with fresh sterilized water in order to remove the dust particles and surface contaminants. The washed leaves samples were cut into small bits with some healthy portions with

[1] Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya224229 (U.P.), Kumargani, India
*Corresponding author email: hksandu@gmail.com

The Pharma Innovation Journal 2021; 10(3): 1010-1013

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2021; 10(3): 1010-1013
© 2021 TPI
www.thepharmajournal.com
Received: 20-09-2020
Accepted: 26-12-2020

Santosh Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

HK Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Santosh Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

First report of *Myrothecium roridum* causing leaf spot on bael (*Aegle marmelos* Correa.) from India

Santosh Kumar and HK Singh

Abstract
Beal (*Aegle marmelos* L. Correa) is native across the Indian subcontinent and is found wild throughout the Indian Peninsula. Cultivation of bael is a lucrative venture because of its high pharmaceutical importance. The deciduous tree with trifoliate aromatic leaves offering of bael leaves is a compulsory ritual of the worship of lord Shiva. The importance of bael lies in its curative properties, make the tree one of the most useful medicinal plant of India. Bael plants suffer from a number of fungal foliar bacterial diseases namely root rot, collar rot, wilt, Alternaria leaf spot, bacterial shot hole, fruit canker, sooty mould and gummosis. In bael nursery/plant, disease appeared during post rainy season, disease symptoms recorded first during rainy season (July- August). Initial symptom were recorded on leaves as small, circular in shape which are brown in colour but later on these spots enlarges and cover the more area up to 40 mm in diameter and later become dark brown with grayish centre. Chlorosis around the lesions may be seen and concentric rings are produced on the middle of the spot on the leaves. Characteristic symptoms of this disease are formation of shot hole due to shedding of necrotic tissues of the leaves. In severe condition number and size of lesions increases, black sporodochia with white and marginal mycelia tuffs bearing black in colour spores masses were observed in the older lesions. This type of symptoms incited by *Myrothecium roridum* was identified as a causal organism. The pathogenicity test of the fungus was established. Fungus produces creamy white colonies on PDA which are 1.5 cm diameter after 5 days at 25+2 ^{0}C. Concentric pattern of sporodochia of *Myrothecium roridum* which are black in colour formed on PDA after 32 days of inoculation. Conidia were aseptate, hyaline, rod shaped and rounded to both ends.

Keywords: *Aegle marmelos, Myrothecium roridum,* leaf spot

Introduction
Bael (*Aegle marmelos* L. Correa) is one of the most utilitarian medicinal plants of India; it grows under adverse agro-climatic conditions. It is known by different names in different parts like Bengal quince, golden apple, stone apple, Bael and Sirphalmaredu (Andhra Pradesh), Bael (Bengal), Bil (Gujarat, Himachal Pradesh), bael (Hindi), bilpatra, kumbala, malura (Karnataka), Vilwam (Kerala), Bilwa (Sanskrit), Kuvalum (Tamil Nadu). The deciduous tree with trifoliate aromatic leaves offering of bael leaves is a compulsory ritual of the worship of lord shiva. It has capacity to adapt successfully to a wide range of habitat from arid, semiarid to mesophytic conditions and a wide temperature tolerance (from -7 ^{0}C to 48 ^{0}C). The ripen bael fruits are popular among people because of the delicious fruit pulp, which is ideal for making jam, syrup and pudding. Bael possesses many medicinal values and therefore used as an ingredient in ayurvedic herbal medical preparations. The fruits, bark, leaves, seeds and roots of bael contain bioactive compounds such as coumarin, xanthotoxol, imperatorin, aegelineandmarmeline. These compounds can provide anticancerous, antidiabetic, antimicrobial, antifertility, immunogenic and insecticidal activities. Bael is also essential as a species for reforestation, especially in the unfertile marginal lands. Bael seeds possess a unique fatty acid (12 hydroxyoctadec-cis 9-enoic acid or ricinoleic acid) a convertible item into biodiesel (Pathirana *et al.* 2020) [4]. The importance of bael lies in its curative properties, make the tree one of the most useful medicinal plant of India. Bael plants suffer from a number of fungal foliar and bacterial diseases namely root rot, collar rot, wilt, Alternaria leaf spot, bacterial shot hole, fruit canker, sooty mould and gummosis. (Anonymous, 2019) [1].

Materials and Methods
The lab work was done in the Department of Plant Pathology and field experiment was conducted at Main Experiment Station, Horticulture situated at main campus of Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.).

Int.J.Curr.Microbiol.App.Sci (2021) *10*(03): 1065-1070

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 10 Number 02 (2021)**
Journal homepage: http://www.ijcmas.com

(34)

Original Research Article https://doi.org/10.20546/ijcmas.2021.1003.134

Evaluation of Different Fungicides against *Alternaria alternata* Leaf Spot of Ber (*Zizyphus mauritiana* Lamk.) under *in vitro* Condition

Shivani Chaudhary*, H. K. Singh and N. Verma

Department of Plant Pathology, A.N.D.U.A. & T., Kumarganj, Ayodhya, U.P., India

**Corresponding author*

A B S T R A C T

To study the effect of different fungicides against Alternaria leaf spot of ber, fungus was isolated from the infected leaves of ber plant and cultural and morphological study was done through Poison Food Technique to find that the fungus was *Alternaria alternata* having branched and septate mycelium with light brown to blackish conidiophores in acropetal chain and the conidia having olive green to dark brown colour with transverse and longitudinal septa. The evaluation of the fungal growth was done with chemical fungicides. A total of nine fungicides were tested at 100, 250, 500, 1000, 1500, 2000 and 2500 ppm concentrations, out of which Hexaconazole 5% EC (97.95%) showed maximum mycelium growth inhibition followed by Tebuconazole 25% EC (96.57%) and Tebuconazole 25% + Trifloxystrobin 25% WG (95.27%) while minimum inhibition was by Propineb 70% WP (78.41%) followed by Carbendazim 50% WP (79.17%). The fungicides tested in present study have also shown potential in controlling *A. alternate* leaf spot disease of Ber.

Keywords

Fruits, Green fodder, Green manure, Irregular brown spots

Article Info

Accepted:
10 February 2021
Available Online:
10 March 2021

Introduction

Indian jujube or ber (*Zizyphus mauritiana* Lamk.) is one of the most common fruit trees grown in tropical and sub-tropical regions, indigenous to an area stretching from India to South West China and Malaysia. It belongs to family *Rhamnaceae*. It is commonly called as Poor man's fruit. Ber is mostly grown in arid and semi-arid regions. The area occupied by Ber in India is over more than 50,000 ha of land with a production of 513,000 MT (Anonymous, 2018; Kaur *et al.*, 2020). It is grown for different purposes *viz*., fruits, green fodder, green manure. The production of ber in terms of fruits and fodder is limited mostly due to the *Alternaria* leaf spot disease caused by *Alternaria alternata*. The fruit are widely acknowledged as a rich and cheap source of minerals such as iron, calcium and

International Journal of Economic Plants 2021, 8(1):040-044 Full Research

Doi: HTTPS://DOI.ORG/10.23910/2/2021.0407

In-vitro Evaluation of Different Botanicals Against *Alternaria alternata* Causing Alternaria Leaf Spot of Ber (*Zizyphus mauritiana* Lamk.)

Shivani Chaudhary* and H. K. Singh

Dept. of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, U.P. (224229), India

Corresponding Author

Shivani Chaudhary
e-mail: schaudharyapril1995@gmail.com

Article History

Article ID: IJEP0407
Received in 10th December, 2020
Received in revised form 17th February, 2021
Accepted in final form 27th February, 2021

Abstract

Evaluation of different botanicals against alternaria leaf spot of ber (*Zizyphus mauritiana* Lamk.) was done under *in-vitro* at the NDUAT, Kumarganj main experiment station of Horticulture and Plant Pathology laboratory during 2018 to 2020. The fungus was isolated from the infected leaves of ber plant and cultural and morphological study was done through Poison Food Technique to confirm that the fungus was *Alternaria alternata* having branched and septate mycelium with light brown to blackish conidiophores in acropetal chain and the conidia having olive green to dark brown colour with transverse and longitudinal septa. The growth of the fungus was tested with botanicals. The nine different botanicals *ie. Azadirachta indica* (Neem), *Allium sativum* (Garlic), *Parthenium hysterophorus* (Parthenium), *Ocimum sanctum* (Tulsi), *Datura stramonium* (Dhatura), *Curcuma longa* (Turmeric), *Zingiber officinale* (Ginger), *Allium cepa* (Onion), *Eucalyptus oblique* (Eucalyptus) were tested against *A. alternata* infection in ber leaves. 100-gram leaves or cloves or rhizomes from each plant were collected and after washing extract was prepared in 100 ml distilled water. The extract was filtered through muslin cloth and then sterilized by passing them through a Millipore filter using a swimming filter adapter. All the botanicals were tested at 10%, 15% and 20% concentration, out of which garlic (74.88%) showed maximum mycelium growth inhibition followed by ginger (73.51%) and *neem* (69.25%), while minimum inhibition was found by Parthenium (34.64%) followed by Dhatura (53.37). It was concluded that the botanicals are also effective in controlling the alternaria leaf spot of ber.

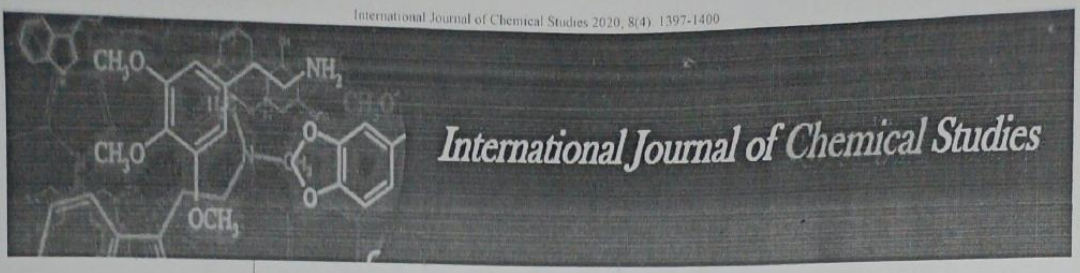
Keywords: *Alternaria alternata*, ber, botanicals, leaf spot disease, phytochemical

1. Introduction

The Ber (*Zizyphus jujube* Lamk.) is mainly grown as a fruit tree in wide range of tropical and sub-tropical and Mediterranean region, is native of India and spread over more than 50,000 ha of land with a production of 513,000 MT (Pareek, 1983., Singh et al., 2016; NHB, 2018., Kaur et al., 2020). "Zizaif" is the Arabic name of the fruit which has been derived from the genus *Zizyphus*. It is commonly called as Poor man's fruit. In India, it is commercially cultivated in Haryana, Punjab, Maharashtra, Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar, Andhra Pradesh and Tamil Nadu. In U.P., Ber orchards are found in Varanasi, Faizabad, Agra, Raebareli districts. The fruit are widely acknowledged as a rich and cheap source of minerals and other nutrients such as iron, calcium and phosphorus, ascorbic acid, carbohydrates and essential minerals (Abbas et al., 1988; Pareek et al., 2002; Alam et al., 2017). The importance of ber is due to the fact that it is hardy fruit which can be grown in alkaline soils with pH as high as 9.2. However, deep sandy loam to loamy soils with neutral or slightly alkaline pH are considered optimum for growth. A principal limiting factor in profitable cultivation of Ber tree is the attack of several diseases mainly fungi which cause heavy crop loss at all the stages, right after initiation of leaves to fruiting and harvest stage. Some important fungal diseases are powdery mildew (*Oidium erysiphoides* f.sp. *ziziphi*), rust (*Phakospora zizyphus vulgaris*), leaf spot (*Alternaria alternata*, *Cercospora zizyphi*, *Cladosporium zizyphi*, *Phoma macrostoma*) and mouldy leaf spot (*Isariopsis indica* var. *zizyphi*). Ber black fruit spot disease caused by *Alternaria alternata* reduces the fruit quality and also yield of the ber (Bai., et al., 1915; Kumar et al., 2015; Manjot et al., 2019; Kaur et al., 2020; Wang et al., 2021: Ajayabhai et al., 2018). The leaf spot disease caused by *Alternaria alternata* is an important disease in the major crop growing areas of the country. The disease leads to formation of irregular brown spots on the upper surface of leaves followed by dark brown to black spots on the lower surface. Later on, the spots coalesce and leaves drop off. The disease occurs widely in crop grown in deep sandy loam to loamy soils. Alternaria leaf spot was a minor disease, but due to climatic changes, it emerged moderately to severe form nowadays.

: Dr. R. K. D... Singh, Vice Ch...

International Journal of Chemical Studies 2020; 8(4): 1397-1400



P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(4): 1397-1400
© 2020 IJCS
Received: 01-05-2020
Accepted: 05-06-2020

Sumant Pratap Singh
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

NA Khan
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Reeshu Singh
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

HK Singh
Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj Ayodhya, Uttar Pradesh, India

S Prasad
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

DK Dwivedi
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sumant Pratap Singh
Department of Plant Molecular and Genetic Engendering, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Documentation variation for Alternaria blight resistance in varieties of Rapeseed mustard

Sumant Pratap Singh, NA Khan, Reeshu Singh, HK Singh, S Prasad and DK Dwivedi

DOI: https://doi.org/10.22271/chemi.2020.v8.i4m.9793

Abstract
The study was conducted with the objective to assess the resistance source against blight in rapeseed-mustard at Student's Instruction Farm, Acharya Narender Deva University of Agriculture and Technology Kumarganj Ayodhya (U.P.) during *Rabi* 2018-19. Screening of Indian mustard 47 genotypes, these screening was not found highly resistant, resistant and moderately resistance against Alternaria blight of rapeseed mustard six genotypes *viz*., Kiran, TMR-14-6, TMR-14-1, TMR-14-5, TMR-14-3, TMR-14-4 with disease severity of 5-10 per cent respectively were rated as moderately susceptible were found nine genotypes with disease severity 11-25 percent. 31genotypes were marked as susceptible in which disease severity was found to be 26 to 50%. The highly susceptible only one genotypes was found to be >50 present with disease severity respectively. It could be noticed that the vulnerability level was relatively quite high as compared to resistance status.

Keywords: Rapeseed- mustard, Alternaria blight, disease reaction, screening

Introduction
Brassica species are the largest oilseed crop in the world oilseed production followed by peanut (*Arachis hypogaea* L.) and sunflower (*Helianthus annus* L.). In India, rapeseed-mustard is grown over in diverse agroclimatic conditions ranging from north-eastern/north-western hills to down south. These crops require cool growing season and moderate temperature throughout, hence are sown in the month of 1 November to 15 November in northern India (Das *et al*., 2009) [4].

Brassica juncea (L.) Czern & Coss., also known by the name of Indian mustard, belongs to the plant family *Brassiceae* (*Cruciferae*) or the mustard family. It is commonly referred to as Rapeseed-mustard along with four other closely related cultivated oilseed species *viz*. *B. rapa*, *B. napus*, *B. carinata* and *Eruca sativa*. Indian mustard is largely self pollinated. Indian mustered (*B. juncea* L. czern and coss). popularly known as rai, raya or laha is one of the most important oil seed crop of the country. *Brassica juncea* (n = 18) is an amphidiploid species derived from interspecific crosses between *B. nigra* (n = 9) and *B. rapa* (n = 10).

Rapeseed mustard are the world's third most important sources of vegetable edible oil. It also contains adequate amounts of the two essential fatty acids, linoleic and linolenic, which are not present in many of the other edible oils. The oil is also used as hair oil and as lubricant. A peculiar use of mustard oil is to retard the fermentation process when making cider from apples. Vegetable oils and fats are valuable food ingredients in human diet. They contain saturated and unsaturated fatty acids. The Indian mustard have nutritional value *viz*., carbohydrates 4.51g, sugar 1.41g, dietary fiber 2g, fat 0.47g and protein 2.56g per 100 g (3.5 oz). It is a good source of protein (28-36%).

The tender leaves of these cultivars serve as vegetable, while the seeds as a source of lubricating and cooking oil. The residue left after oil extraction being rich in protein (Durrani and Khalil, 1990; Chattopadhyay *et al*., 2005) [6, 3] can be used as livestock feed. It produces 9 k cal energy from 1gm of oil per unit in comparison with other diets (carbohydrate and Protein). Mustard seeds have relatively high protein content (28-36%). Until now mustard seeds have been used mainly for condiment production. (Gadei *et al*., 2012) Mustard oil contains a high amount of selenium and magnesium, which gives it anti-inflammatory properties.

Int.J.Curr.Microbiol.App.Sci (2020) *9*(9): 3150-3154

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 9 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2020.909.389

Efficacy of Newer Molecules of Fungicides against *Alternaria brassicae in vitro*

Neeraj Kumar Rajvanshi*, H. K. Singh and Manish Kumar Maurya

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya-224229 (U.P.) India

**Corresponding author*

Keywords

Fungicides, Radial growth, *Alternaria brassicae, in vitro*

Article Info

Accepted:
20 August 2020
Available Online:
10 September 2020

A B S T R A C T

Rapeseed-mustard belongs to family Brassicaceae. It is the most important group of *rabi* oilseed crops and contribute a major share to the vegetable fat of the country. Effectiveness of the six fungicides *i.e.* Quintal (Iprodione 25% + Carbendazim 25%), Nativo (Tebuconazole 50% + Trifloxystrobin 25% 75GW), Tilt (Propiconazole 25 EC), Score (Difenoconazole 25 EC) and Propineb (Antracol 70 WP), Folicur (Tebuconazole 250 EC) were used at three concentrations of each @ 0.05, 0.1 and 0.2 per cent and one is no treatment (control) under *in vitro* against *Alternaria brassicae* by poison food technique. At 0.05% concentration of fungicides the minimum growth was recorded in Iprodione 25% + Carbendazim 25% (47.47mm) followed by Propineb 70 WP (52.56mm) had significantly reduced the mycelia growth of tested pathogen by food poison technique than the control (90.00mm). In case of 0.1% concentration of fungicides the minimum growth was recorded in Iprodione 25% + Carbendazim 25% (38.09mm) followed by Propineb 70 WP (43.00mm) had significantly reduced the mycelia growth of tested pathogen than the control (90.00mm). In case of 0.2% concentration of fungicides the minimum growth was recorded in Iprodione 25% + Carbendazim 25% (27.84mm) followed by Propineb 70 WP (30.84mm), had significantly reduced the mycelia growth of tested pathogen than the control (90.00mm). Four treatments namely Tebuconazole 250 EC + Trifloxystrobin WG 75; Propiconazole 25 EC; Difenoconazole 25 EC and Tebuconazole 250 EC were tested by poison food technique *in vitro* and result cent per cent restriction of radial growth of *Alternaria brassicae* in 0.05%, 0.1% and 0.2% concentration.

Introduction

Rapeseed-mustard belongs to family Brassicaceae, which is grown in northern India comprising traditionally grown indigenous species namely Indian mustard (*B. juncea*), brown *sarson* (*B. campestris* var. brown *sarson*), yellow *sarson* (*B. campestris* var. yellow *sarson*), toria *(B. campestris* var. toria), taramira (*Eruca sativa*), gobhi *sarson* (*B. napus*), white mustard *(B. alba)* and Ethiopian mustard (*B. carinata*). It is the most important group of *rabi* oilseed crops and contribute a major share to the vegetable fat of the country. Oil and fats comprise a vital component of human diet as these are good

Int.J.Curr.Microbiol.App.Sci (2020) *9*(10): 973-978

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 10 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.910.116

Screening of Ber (*Zizyphus mauritiana* Lamk) Cultivars / Germplasm against *Alternaria alternata* (Fr.) Keissler Causing Alternaria Leaf Spot

Akash Kumar*, H. K. Singh and Satya Prakash Vishwakarma

Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224 229 (U.P.) India

**Corresponding author*

Keywords

Ber,
Zizyphus mauritiana

Article Info

Accepted:
10 September 2020
Available Online:
10 October 2020

A B S T R A C T

Ber (*Zizyphus mauritiana* Lamk) is one of the important fruit crops of arid and semi arid zones of the world. In India though it is a minor fruit but recently the ber become an important cash crop in some areas and its acreage and production are increased. Due to rapid spread of commercial cultivation, the crop is also affected by different biotic and abiotic factors including pathogens causing many serious diseases. Among the diseases, *Alternaria alternata* is one of the most important, widespread and easily recognized disease. The disease is characterized by the formation of small, irregular brown spots on upper surface of leaves. Corresponding lower side appears with dark brown to black spot 3 to 6 mm in diameter with a gray to tan centre and distinct brownish yellow margins. Under humid conditions, black patches comprising plenty of conidia can be seen and which severe as air borne inoculation. As in case of ber plants, under severe conditions many spots coalesce to form big patches and later such leaves defoliated from branches. In varietal screening, forty varieties/germplasm was screened against *Alternaria alternata* (Fr.) Keissler. It was recorded that none of the variety was found free from disease and only 3 germplasm, Narendra ber Selection-1 (3.50%) Seo (4.0%) and Narendra ber Selection-2 (4.60% area covered with the pathogen) were found resistant and 20 genotypes having disease intensity 5.01 to 20% area covered with the pathogen were moderately susceptible, 13 genotypes having disease intensity to 20.01 to 50% area covered with the pathogen were susceptible and 4 genotypes namely genotypes having disease intensity > 50% area covered with the pathogen were found highly susceptible.

Introduction

Indian jujube or ber (*Zizyphus mauritiana* Lamk.) is one of the most common fruit; indigenous to an area joined from India to China belongs to family Rhamnaceae. It is also known as Chinese date or Chinese fig or plum and commonly considered as poor man's fruit. It is popularly called the king of arid zone fruit (Yamadagni, 1985; Shoba and Bharathi, 2007; Mishra *et al.*, 2013). This fruit probably originated in India. It is reported to be grown in other countries like Iran, Syria, Australia, USA, France, and certain part of Italy, Spain, Africa, etc. Precisely, it is seen to grow under tropical and

Journal of AgriSearch 5(3):175-183
ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.5.3.6

Screening of Genotypes against Alternaria Blight of Rapeseed-Mustard and its Fungicidal Management

HKSINGH*, SUDHAKAR SHUKLA, JAY KUMAR YADAV, MANISH KUMAR MAURYA AND KN MAURYA[1]

Department Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad -224229 (U.P.), India

ARTICLE INFO

Received on	:	17.11.2017
Accepted on	:	29.08.2018
Published online	:	05.09.2018

ABSTRACT

Alternaria blight is a destructive disease of rapeseed-mustardcaused by *Alternaria brassicae* (Berk) Sacc. and *A. brassicicola* (Schw). The field experiments were conducted during 2013-14 and 2014-15, with 200 genotypes for evaluation of their resistance to Alternaria blight, as well as to develop effective management strategies for this disease. None of the genotypes were found disease-free or highly resistant, only 7 genotypes namely (DLSC-1, DRMR-261, DRMR-270, GSC-101, GSL-1, NPC-20, and PHR-2) were found resistant, 15 genotypes were rated as moderately resistant. Rest of the genotypes was either recorded susceptible or highly susceptible. For disease management, newly molecules of 6 fungicides were evaluated with 13 treatments combinations for their effectiveness. Propiconazole 25% EC @ 0.10% was found most effective in reducing the disease severity followed by the same fungicide @ 0.05%. It was followed by Hexaconazole 5% SC @ 0.010%. Maximum test weight and yield were also recorded with the sprays of Propiconazole 25% EC @ 0.10% followed by the same fungicide @ 0.05%. In comparison to other fungicides, the maximum B:C ratio was recorded with three sprays of Hexaconazole 5% SC @ 0.05% followed by Propiconazole 25% EC @ 0.05%.

Keywords: S

INTRODUCTION

The oilseed crops, especially *Brassica* spp. play a pivotal role in the agricultural economy of India. Rapeseed-mustard, among these, are most important *rabi* crops. India is one of the leading countries with respect to production, consumption ,and import of vegetable oils (Singh *et al*.,2013). Alternaria blight caused by *Alternaria brassicae* (Berk) Sacc. and *A. brassicicola* (Schw) Wiltshire is one of the major limiting factor, causing yield losses from 17 to 45% in mustard (*Brassica juncea* L.) (Singh and Singh, 2005a, Singh and Singh, 2006, Kumar *et al*., 2009) and upto 70% in rapeseed of yellow *sarson* and brown *sarson* (*Brassica compestris*) (Kolte, 2002). The blight also reduces the seed size; seed colour and oil content. In the absence of resistant cultivars, the disease was managed through cultural practices and by using different fungicides up to certain levels (Singh and Singh, 2005b, Singh *et al*., 2008 and Singh *et al*., 2013).

Since the chemical compound is not safe for the human being, animals even also to the microbes (Ko and Farley, 1969). The ideal and most economical means of managing the Alternaria blight disease of rapeseed and mustard would be the use of resistant varieties. In the absence of resistant cultivars, chemical fungicides provide the most reliable means of disease control (Singh *et al*., 2014). Therefore, in the present study, efforts have been made to find out suitable genotypes, newly molecule of fungicides for the management of *Alternaria* blight of mustard.

[1]*Department Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad -224229 (U.P.), India*
*Corresponding Author Email : hksndu@gmail.com

MATERIALS AND METHODS

The investigations were carried out at Genetics and Plant Breeding Research Farm and in the laboratory of the Department of Plant Pathology, N.D. University of Agriculture &Technology, Kumarganj, Faizabad, Uttar Pradesh, India. This investigation consisted of two separate components *i.e.* varietal screening for host resistance and use of newly molecule fungicides in Indian mustard [*Brassica juncea* (L.) Czern & Coss.]for the management of the disease.

Varietal resistance:

Two Hundred (200) promising genotypes/cultivars supplied by Directorate of rapeseed-mustard research, Sewar, Bharatpur, Rajasthan were normals own in the first week of November during 2013-14 and 2014-15*rabi* season. All the entries were planted in paired rows and replicated twice. Plant to plant and row to row spacing was maintained as 30x10cm. The crop was fertilized with NPK in the ratio of 120:60:60 kg/ha to obtain a good crop. The disease severity was recorded following scale as per the recommendation of All India Coordinated Research Project on Rapeseed-Mustard, 2017 which is as under. [0=No lesion [Immune (I)]; 1= Non sporulating pinpoint size or small brown necrotic spots, less than 5% leaf area covered by the lesions [Highly resistant (HR)]; 3= small roundish slightly sporulating larger brown necrotic spot, about 1-2 mm in diameter with a distinct margin or yellow halo, 5-10% leaf area covered by lesions [Resistant (R)]; 5= moderate sporulation, non-coalescing larger brown spots, about 2-4mm in diameter with a distinct margin or yellow halo, 11-25% leaf area covered by the lesions

Author's personal copy

Indian Phytopathology (2018) 71:159–162
https://doi.org/10.1007/s42360-018-0017-z

SHORT COMMUNICATION

Genetics and allelic relationship between genes conferring resistance to wilt in linseed

M. P. Chauhan[1] · H. K. Singh[2] · J. K. Yadav[2] · S. K. Singh[3]

Received: 15 November 2017 / Accepted: 29 January 2018 / Published online: 15 March 2018
© Indian Phytopathological Society 2018

Abstract
The inheritance of resistance against wilt caused by *Fusarium oxysporum* f. sp. *lini* in linseed was studied in F_1, BC_1, BC_2 and F_2 generations of three resistant varieties, Nagarkot, Shekhar and NDL 2004-05 crossed with two susceptible cultivars, Chambal and Shikha. On the basis of the segregating ratio obtained in F_2 and back cross generations of the two crosses, Nagarkot × Chambal and Nagarkot × Shikha, the disease resistance was controlled by two recessive alleles with complimentary gene action in the variety Nagarkot. On contrary, in the cross Shekhar × Chambal and Shekhar × Shikha two dominant genes with complimentary gene action confirming wilt resistance in Shekhar. In NDL 2004-05 × Chambal and NDL 2004-05 × Shikha, reaction of linseed plants to wilt in F_1, BC_1, BC_2 and F_2 generations suggested that resistance to disease is under monogenic control with one dominant gene responsible for resistance in NDL 2004-05. These resistant genotypes may be used as donor for transferring resistance in otherwise susceptible cultivars using breeding programme.

Keywords Genetics · Linseed · Resistance · Wilt

Linseed is one of the oldest oil seed crop cultivated by human being for food, fibre, industrial and value addition. Recent advances in neuro-biology have established that it is best herbal source of Omega-3 fatty acids which helps in regulating the nervous system. The lustrous fibre of linseed coupled with strength, durability, blending quality with natural and artificial fibres has made its fibre an essential raw material for high value linen fabrics and paper industry for use of printed bank notes and cigarettes. The unique and diverse properties of linseed are reviving interest in this crop and because of its adaptability and product diversity, it is being considered as a platform for the development of novel bio-products. India ranks second in area after Canada in the world, but is at fourth place in terms of production after Canada, China and USA. In terms of productivity India (435 kg/ha) is far below to Canada (1492 kg/ha), USA (1484 kg/ha), Egypt (1465 kg/ha), Russia (1292 kg/ha) and China (944 kg/ha) (Anonymous 2015). The linseed crop is affected by several diseases throughout the world. Wilt caused by *Fusarium oxysporum* Schl. f. sp. *lini* (Bolley) [Snyder and Hansen (Syn. f. sp. *lini* Bolley)] is the most serious disease of linseed (Kishore et al. 2011). The first record of this disease was by Luggar (1890) from Minnesota, USA. In India, the disease was first reported from Madhya Pradesh (Pearl 1924). The plants are susceptible at all growth stages and growth of the plant ceases when infected at seedling state. Leaves at ground level get constricted, gradually wither off and die out. In the grown up plants, ill-defined dark green or brownish spot develops on the leaves. Such leaves shrivel and dry off followed by drooping off and death of the plants. Kumar et al. (2015) reported loss up to 80% under conditions favourable for wilt development. However, extent of damage largely depends upon incidence of disease and time of attack during the crop season (Vasudeva 1962). In the severe form of the disease, the crop may be completely destroyed. Use of resistant cultivars are the best options available for the management of the wilt. Therefore, the breeder has to look the gene(s) for resistance in the genotypes. The information on inheritance

✉ H. K. Singh
hksndu@gmail.com

1 Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh 224 229, India

2 Department of Plant Pathology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh 224 229, India

3 Crop Research Station, Tisuhi, Mirzapur, Uttar Pradesh 231 001, India

Int.J.Curr.Microbiol.App.Sci (2018) 7(2): 2463-2469

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 02 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.702.300

Management of Alternaria Blight through Genotypes, Fungicides, Bio-Agents and Botanical in Rapeseed-Mustard

H.K. Singh[1*], Jay Kumar Yadav[1], Manish Kumar Maurya[1] and S.K. Singh[2]

[1]*Department Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad -224229 (U.P.), India*
[2]*Crop Research Station Tissuhi, Mirzapur-231001 (U. P.), India*

**Corresponding author*

Keywords

Rapeseed and mustard, Alternaria blight, Management

Article Info

Accepted:
20 January 2018
Available Online:
10 February 2018

A B S T R A C T

Alternaria blight caused by *Alternaria brassicae* (Berk) Sacc. and *A. brassicicola* (Schw) Wiltshire is one of the most common and destructive disease of rapeseed-mustard. The experiments were conducted under field condition to develop effective management strategies for this disease through evaluation of genotypes for resistance and application of fungicide, bio-agents and botanical. Out of 200 promising genotypes evaluated for resistance, none of the entry was found resistant, twenty two genotypes namely DLSC-1, DRMR-261, DRMR-270, GSC-101, GSL-1, NPC-20 and PHR-2, CNH-11-13, CNH-11-7, EC-552608, HNS-1001, PAB 04-10, PAB 05-16, PAB 05-19, PAB 09-05, PAB-2004-4, PAB-2005-16, PPBJ 5, PPBJ-2, PPBJ-3, PPBN 3 and PPBN-2 were moderately resistant and 63 genotypes moderately susceptible. Seed treatment with Apron @ 6g/Kg seed and spray of all fungicides, bio-agents and botanical extract, significantly reduced the blight severity in comparison to the untreated control (water spray). Of the fungicides, Nativo @ 0.05% was found most effective followed by Difenconazole @ 0.05%, Iprodione @ 0.2, Folicure @ 0.2, Difolatan@ 0.2, Mancozeb @ 0.2, Antracol @ 0.25, *Pseudomonas fluorescens* @ 1.0, *Trichoderma harzianum* @ 1.0 and Garlic bulb extract @ 1.0 which showed 8.70%, 14.62%, 16.27%, 16.41%, 18.54%, 20.51%, 21.42%, 24.27%, 25.42%, and 26.83% severity, respectively after third spray of each chemical, bio-agents and botanical extract. The disease severity of water spray control was 69.10%. Same tread was also recorded with per cent disease control. Maximum seed yield (kg/ha) and yield increase (%) of 1740.22, 37.90 was recorded with the treatment Nativo @ 0.05% followed by Difenconazole @ 0.05% (1629.61, 29.16), Iprodione @ 0.2 (1617.11, 28.17), Folicure @ 0.2 (1587.50, 25.85), *Trichoderma harzianum* @ 1.0 (1525.68, 20.93), Difolatan @ 0.2 (1516.98, 2024), *Pseudomonas fluorescens* @ 1.0 (1512.37, 1987), Antracol @ 0.25 (1511.45,19.80), Mancozeb @ 0.2 (1507.99, 19.52), respectively. The maximum benefit cost ratio 1:12.60 was obtained with Garlic bulb extract @1.0 followed by *Trichoderma harzianum* @ 1.0 (1:6.0), Nativo @ 0.05% (1:4.01), *Pseudomonas flurescence* @ 1.0 (1:3.79).

Int.J.Curr.Microbiol.App.Sci (2018) *7*(2): 3689-3699

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 02 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.702.438

Effect of Mancozeb on Disease Severity, Infection Rate and Seed Weight of Mustard [*Brassica juncea* (L.) Czen & Coss.] Caused by *Alternaria* spp.

Manoj Kumar Pandey[1], Narender Kumar[2], Hemant Kumar Singh[1] and Surender Kumar[2*]

[1]Department of Plant Pathology, N. D. University of Agriculture and Technology, Faizabad-224229, U.P., India
[2]C. S. Azad University of Agriculture and Technology, Kanpur-208002, India
**Corresponding author*

Keywords

Alternaria blight, Disease severity, Mancozeb, Mustard, Test weight

Article Info

Accepted:
28 January 2018
Available Online:
10 February 2018

A B S T R A C T

In case of fungicidal trails all the treatments reduced the disease severity in comparison to unsprayed plots. The severity of disease after eight spray of Mancozeb @ 0.2 % was found minimum disease severity (5.0 %) followed by seven spray (6.0 %) and six spray (10.33 %), respectively. Maximum seed yield of 2000kg/ha was recorded with eight spray of Mancozeb @ 0.2% followed by seven spray (1922.22 kg/ha), and six spray (1902.77 kg/ha), respectively. Similar trend was recorded in case of test weight also. All the treatments avoided test weight loss of 5.70 to 21.81 %. Maximum being with eight and seven spray of Mancozeb @ 0.2 % (21.81 %) followed by six spray (21.67 %) and five spray (20.81 %).Maximum yield loss of 48.61 per cent was also avoided with eight spray of Mancozeb @ 0.2 % followed by seven sprays (46.53 %) and five spray (45.94 %).The maximum benefit cost ratio of 1:7.94 and 1:7.18 were obtained with four and three spray of Mancozeb @ 0.2 % followed by five sprays (1:6.82) and two spray (1:6.11).

Introduction

Oilseed crops play an important role in agricultural economy of India. Oilseed brassicas often called rapeseed-mustard Kumar *et al.*, (2014) placed in *Brassicaceae* family which contains about 3500 species and 350 genera, is one of the 10 most economically important plant families. According to ancient scripture and literature, it has been cultivated as early as 5000 BC. There is evidence of its cultivation in Neolithic age. Seeds of mustard were found from the Channhudaro of Harrapan civilization ca. 2300-1750 BC. Among the oilseed brassicas, mustard (*Brassica juncea*), yellow sarson (*B. campestris* var. *yellow sarson*), brown sarson (*B. campestris* var. *brown sarson*), toria (*B. campestris* var. *toria*), oilseed rape (*B. napus*) and Karan rai (*B. carinata*) are grown for edible oil whereas black mustard (*B. nigra*) is used as a condiment for pickle making Kumar *et al.*, (2014).

Among rapeseed-mustard, Indian mustard [*Brassica juncea* (L.) Czern & Coss.] is one

Journal of AgriSearch 5(1):1-4

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v5i01.11123

Extent and pattern of genetic diversity in linseed (*Linum usitatissimum* L) under irrigated ecology

MP CHAUHAN, HK SINGH[1]* JAY KUMAR YADAV[1] AND MK MAURYA[1]

Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.), India

ARTICLE INFO

Received on	:	01/07/2017
Accepted on	:	9/02/2018
Published online	:	27/02/2018

ABSTRACT

Sixty six genotypes of linseed were analysed for the morphological traits to investigate the genetic diversity between and within the genotypes. The field data was initially subjected to analysis of variance. There were highly significant differences among the genotypes for all the traits indicating the presence of variability among the genotypes and the possibility to undertake cluster analysis. The phenotypic divergence and relative importance were estimated by multivariate analysis. The cluster analysis classified linseed genotypes in to nine major groups. The maximum intercluster diversity was observed between cluster VIII and V. Based on mean performance of the genotypes and intercluster distance the crosses between ICAR Sel-1 and L-9, NDC 2005-34, H660, LCK 87042, NDL2005-22, GS335 is recommended to get use full transgressive sergeants in linseed.

Key words: Crosses, Diversity, Genotypes, Intercluster, Linseed

INTRODUCTION

Linseed/flax is among the oldest crop plants cultivated in temperate climate for the purpose of oil and fibre (Pati and Mehta, 2015). Recent genetic diversity studies suggest that flax may have initially selected as an oil seed crop. Linseed a minor crop is grown in a wide range of countries (47), climates, cropping situations and for many products. At present it is widely cultivated in Asia, Europe, Americas and Africa for oil and fibre. In South west Asia including Turkistan, Afghanistan, India, Nepal and Canada it is primarily cultivated for oil whereas in Russia, Egypt and Near the North western Europe it is mainly cultivated for the production of high quality fibre for making linen fabrics and several other products (Anonymous, 2017).

Breeding programmes is currently focused on enhancing oil content and nutritional value to meet the demand of nutraceutical market. The lustrous fibre of linseed coupled with strength, durability, blending quality with natural and artificial fibres has made its fibre an essential raw material for high value linen fabrics and paper industry for use of printed bank notes and cigarettes. Studies on variation in the germplasm are very useful for developing high yielding disease and insect pest resistant cultivars. The available germplasm serves most valuable natural reservoir in providing donor, parents for in corporating or importing the characteristics by genetic reconstruction of plant for developing high yielding crop varieties.

The proper evaluation of germplasm is essential for understanding its potential value as a breeding material as the success of any breeding programmes depends upon nature and extent of variability present in the germplasm collection. In view of these facts, large numbers of germplasm lines (sixty six) were evaluated in the present investigation.

MATERIALS AND METHODS

A total number of sixty six genotypes of linseed were used in the present study. All the genotypes including three checks T 397, Mukta and Hira were raised at Genetics and Plant Breeding Farm of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during rabi session 2015-16under irrigated conditions for recording the data. The experiment was laid out in augmented block design. The experimental field was divided into three blocks of twenty four plots. The checks were distributed randomly in each block. Each plot consisted of double row of 5 meter length spaced 30 cm apart with plants to plant distance of 10cm observations on the ten traits were recorded viz: days to 50 % flowering, plant height (cm), number of primary branches / plant, number of secondary branches /plant, number of capsules / plant, number of seeds / capsule, biological yield per plant (g), seed yield per plant (g), harvest index (%)and test weight (g).

Five randomly selected plant were tagged from each row for taking observation of all the traits except days to 50% flowering which was recorded on line basis. The data recorded for each genotype was subjected to statistical analysis. Harvest index in per cent was calculated by dividing the seed yield per plant in grams by the biological yield per plant in grams. The data were subjected to statistical analysis to work out mean range as per standard methods. The genetic divergence was studied by employing and non–hierarchical Euclidean cluster analysis (Beale, 1969; Spark, 1973).

[1]Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.), India
*Corresponding Author Email : hksndua@gmail.com

Journal of AgriSearch 5(1):44-49

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v5i01.11133

Correlation coefficient between early blight severity, infection rates and meteorological factors in potato under different fungicidal spray

AJAY KUMAR*, SK SINGH, NARENDER KUMAR[1], VIPIN KUMAR[2], MAHESH SINGH[3] AND HK SINGH

Department of Plant Pathology, ND University of Agriculture and Technology, Kumarganj, Faizabad-224 229, UP, India

ARTICLE INFO

Received on	:	08/01/2018
Accepted on	:	20/2/2018
Published online	:	27/02/2018

ABSTRACT

Early blight caused by *Alternaria solani* is a severe constraint in potato production. The severity of this disease has been increasing day by day for last few years in India due to changes in weather. Disease severity and area under disease progress curve (AUDPC) was recorded in each treatment plot. The early blight disease had significant negative correlation with maximum relative humidity during 2012-13 and in year 2013-14 minimum temperature was significantly correlated. The severity of early blight showed significant positive correlation with maximum temperature and highly significant positive correlations with sun shine hours in year 2013-14 in all tested treatments. The study showed that minimum temperature and rainfall revealed negative but non-significant correlation in all treatments except untreated control in year 2012-13. The maximum tuber yield 223.70 and 222.00 q/ha in first and second years, respectively, were recorded with spray of Fenamidone @ 0.2% at disease initiation and 2nd spray of Mancozeb @ 0.25% followed by Mancozeb @ 0.25% at 15 days intervals in both respective years.

Key words: Early blight, *Alternaria solani*, Infection rate, Severity, Potato, Fungicides

INTRODUCTION

Potato (*Solanum tuberosum* L.) belongs to family Solanaceae and it is the most important crop among the all vegetables. Potato crop suffers from a number of fungal diseases and causes 20 to 64 per cent losses in yield when favourable condition prevailed. It is attacked by several pathogens, causing serious diseases. Among fungal diseases, early blight is a major one on potato. It is caused by fungus *Alternaria solani* (Ell. and Mart.) Jones and Grout is the most important disease attacking potato plants in different countries of the world. The disease in severe stage can lead to complete defoliation. It is most damaging on potato in regions with heavy dew, rainfall, high humidity, and fairly high temperature (24-29°C). *A. solani* has the capability to grow over a temperature of 4-36°C. Temperature is one of the most important uncontrollable factors affecting crop yield and heat stress is an agricultural problem in many areas in the world (Birch *et al.* 2012).

At global level annual production of potato during 2013 was 453.44 million tonnes covering an area of 19.92 million hectare with the productivity of 22.8 tonnes per hectare. Indian contribution to the world's production was 45.34 million tonnes from 1.99 million hectare area with average productivity of 22.8 tonnes per hectare (Anonymous, 2013). The management of potato crops against this pathogen is important to maximize the crops' yield. The disease occurs throughout the major potato production areas and it is difficult to produce both the crops during the main rainy season without chemical protection measures (Sahu *et al.* 2013a; Kumar and Shrivastava, 2013). Several components are available on their management. Basically, this disease is controlled with chemicals. Several chemicals, derivatives of chlorothalonil, are more effectiveness for potato late blight control and early blight also, compared to copper based products. A number of control measures for minimizing the disease losses have been recommended by different workers but the use of resistant cultivars remains the most reliable and economical one. Environmental factors play a key role in the development of the disease. The spores remain on the soil surface and on the leaves. Early blight develops more rapidly during periods when environmental conditions alternate between humidity and drought.

In recent years, many studies have been carried out to examine the presence and dispersion of pathogenic fungal spores in crops (Olga *et al.*, 2010). Many authors have developed epidemiological models, in order to predict when the disease will occur and to improve the use of control measures. The correlation between weather and disease severity has been recognized by many authors in different parts of the world (Devi and Chanu, 2012). Atmospheric *Alternaria* spores, temperature and humidity are the factors that most closely correlate with the occurrence of this disease. In the present study, investigation was carried out to elucidate relationship between weather variables and disease progression and evaluate the fungicides in different spray schedules for management of early blight disease. Keeping in view the need of management practices with meteorological factors, the "study on early blight development and infection rates under field conditions" is undertaken with objectives: To

[1]Department of Plant Pathology, CSAUA&T, Kanpur- 208002, UP, India
[2]Department of Plant Pathology, SVBPUT, Meerut-250110, UP, India
[3]School of Agriculture, ITM University, Gwalior-475001, MP, India
*Corresponding Author Email : [redacted]

Journal of AgriSearch 4(4):280-284
ISSN : 2348-8808 (Print), 2348-8867 (Online)
http://dx.doi.org/10.21921/jas.v4i04.10210

Chemical Constituents in Some Promising Genotypes of Indian Mustard [*Brassica juncea* (L.) Czern and Coss.]

SUNITA SINGH, RP SINGH, HK SINGH[1]*, NA KHAN[2] AND MK MAURYA[1]

Department of Chemistry, Kamla Nehru Institute of Physical and Social Sciences, Sultanpur, Uttar Pradesh, India

ARTICLE INFO

Received on	:	18.07.2017
Accepted on	:	12.11.2017
Published online	:	30.11.2017

ABSTRACT

Among the oilseed *Brassica* crops, Indian mustard [*Brassica juncea* (L.) Czern & Coss.] is an important source of oil from a nutritional point of view. The nutritional value of oil and cake quality is governed mainly by the composition of its fatty acids, iodine value, saponification, acid value, glucosinolates, crude fibre, protein and limiting amino acids, etc. Seventeen varieties/strains of Indian mustard were taken for saturated and unsaturated fatty acid analysis. The eicosenoic was absent in genotype (NUDBYJ-10) and erucic acid (NUDBYJ-10, LES-46 and Pusa mustard- 21). The fatty acid composition found a variable in different genotypes. Saturated fatty acid, Palmitic + Stearic ranged between 2.3 to 6.5%, Oleic 10.6 to 40.7%, Linoleic 16.1 to 37.7%, Linolenic 13.3 to 26.7%, Eicosenoic 0.00 to 10.30% and Erucic acid 0.00 to 47.50%, respectively. Alternaria blight severity also varied in different genotypes and ranged between 18.75 to 56.25%, maximum being in genotype Kranti and minimum in LES-47. No significant correlation was observed between the fatty acid composition and disease severity. The oil content range from 38.1 to 42.60% and protein content was found highest in variety RGN-73. The amino acid viz. methionine and tryptophan range between 0.41 to 1.81 g/16gN and 0.41 to 1.81 g/16g N, respectively.

Keywords: Indian mustard, Fatty acid, Alternaria blight, Methionine, Tryptophan

INTRODUCTION

Brassicas are members of the Brassicaceae family (Singh *et al.*, 2017a). They occupy a unique position in world agriculture as the source of vegetables, oilseed, forage and fodder, green manure and condiments. *Brassica* seed oil is used for the edible purpose, as industrial lubricants and as a base for polymer synthesis. Oilseed brassica cake is used as a source of protein in animal feeds (Singh *et al.*, 2017b). Among the oilseed *Brassica* crops, Indian mustard [*Brassica juncea* (L.) Czern and Coss.] is an important source of oil from a nutritional point of view (Singh *et al.*, 2014). The nutritional value of oil is governed mainly by the composition of its fatty acids *viz.* Palmitic acid, Stearic acid, Oleic acid, Linoleic acid, Linolenic acid, Eicosenoic acid, Erucic acid along with anti-nutritional factors (Singh *et al.*, 2017a).

Indian mustard has a higher amount of erucic acid and glucosinolates in its oil and meal, respectively (Kewat, 2002). The high amount of glucosinolates in the meal and erucic acid in oil may create health problems *viz.* lipidopsis in young animals, fibrosis in older animals, reduce food intake, causes goitre, stroma and cancer (Singh *et al.*, 2013). In *Brassica* breeding, considerable emphasis is being laid to develop the varieties with low glucosinolates and low erucic acid. The development of rapid and accurate methods for determination of glucosinolate levels in seed in early 1960's led to the identification of *B. napus* cultivar "Bronowski" from Poland. The first double low spring *B. napus* cultivar "Tower" was released in 1974 and afterwards, a number of double zero cultivars were identified in different countries of the world. In India till date, the main emphasis has been to improve the rapeseed-mustard seed yield and oil content. It is necessary that seed oil quality especially the fatty acid composition also be improved wherever possible. Keeping this in view there is a need to screen/develop Indian mustard varieties having low erucic acid (Singh *et al.*, 2013).

MATERIALS AND METHODS

Seeds of seventeen genotypes of Indian mustard were obtained from different coordinating centers of AICRP on Rapeseed-mustard and Department of Genetics and Plant Breeding of ND University of Agriculture and Technology, Kumarganj, Faizabad and were sown at GPB Farm of the University. Five plants of each genotype were bagged for self-pollination and seeds were collected for a further study of chemical composition. Incidence and severity of Alternaria blight disease on each genotype were also recorded. The collected seeds were sun-dried followed by oven drying and were used as the experimental materials in the present investigation for chemical composition analysis. The oil content was determined by Soxhlet Extraction Procedure using petroleum ether (boiling point range 40-60°C) by AOAC (1970).

Oil content

Seed sample was kept in the oven at 70°C for removal of moisture. After removal of moisture, the seed was ground in mortar and pestle for extraction of oil. The conventional

[1]Department of Plant Pathology, ND University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India
[2]Department of Biotechnology, ND University of Agriculture and Technology, Kumarganj, Faizabad Uttar Pradesh, India
*Corresponding Author Email: hksenduegmail.com

Journal of AgriSearch 4(3):212-214
ISSN : 2348-8808 (Print), 2348-8867 (Online)
http://dx.doi.org/10.21921/jas.v4i03.9026

Influence of Sulphur and Zinc on Biochemical Properties and Severity of Alternaria Blight in Indian Mustard

HK SINGH*, SUNITA SINGH[1], NA KHAN[2], RP SINGH[1] AND MK MAURYA

Department of Plant Pathology, ND University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

ARTICLE INFO

Received on	:	21.07.2017
Accepted on	:	30.08.2017
Published online	:	05.09.2017

ABSTRACT

Effect of different doses of sulphur and zinc application was studied on Indian mustard [*Brassica juncea* (L.) Czern & Coss.] for protein, methionine, tryptophan, allyl-isothiocynate, mineral status content in oil/cake and Alternaria blight severity (%). The highest protein content was obtained in Varuna variety followed by strain NDR 8501. Application of 40 kg sulphur and 40 kg zinc resulted in highest protein percentage over control in seeds of mustard. Methionine content ranged from 0.743-1.561 g/16g N in Varuna variety whereas it varied from 0.899 to 1.503 g/16 g N in strain NDR 8501. Methionine contents were increased significantly due to the application of sulphur and zinc. Sulphur is an essential constituent of sulphur containing amino acids viz. methionine, cysteine and cystine. Variation in tryptophan content was recorded from 0.545 to 1.079 g/16 g N in Varuna variety whereas it varied from 0.501 to 1.545 g/16 g N strain NDR 8501. The highest rate of application of sulphur and zinc resulted in the highest content of minerals. The highest allyl-isothiocynate content in oil (0.342%) was recorded in variety NDR 8501 followed by Varuna (0.311%) variety. The minimum Alternaria blight severity was recorded in the dose of $S_{40}Zn_{40}$ (34.57, 32.04) in variety Varuna and NDR 8501, respectively.

Key words: Indian mustard, Nutritive value of cake and oil, Sulphur, Zinc, Alternaria blight

INTRODUCTION

Brassicas are members of the Brassicaceae family. They occupy a unique position in world agriculture as the source of vegetables, oilseed, forage and fodder, green manure and condiments (Singh *et al.*, 2017) *Brassica* seed oilis used for edible purpose, as industrial lubricants and as base for polymer synthesis. Oilseed brassica cake is used as a source of protein in animal feeds. Among the oilseed *Brassica* crops, Indian mustard [*Brassica juncea* (L.) Czern & Coss.] is an important source of oil from nutritional point of view (Singh *et al.*, 2013). The nutritional value of oil is governed mainly by the composition of its fatty acids *viz*. Palmitic acid, Stearic acid, Oleic acid, Linoleic acid, Linolenic acid, Eicosenoic acid, Erucic acid along with anti-nutritional factors.

Indian mustard has higher amount of erucic acid and glucosinolates in its oil and meal, respectively. The high amount of glucosinolates in meal and erucic acid in oil may create health problems *viz*. lipidopsis in young animals, fibrosis in older animals, reduce food intake, causes goiter, stroma and cancer. In *Brassica* breeding, considerable emphasis is being laid to develop the varieties with low glucosinolates and low erucic acid. The development of rapid and accurate methods for determination of glucosinolate levels in seed in early 1960's led to the identification of *B. napus* cultivar "Bronowski" from Poland.The first double low spring *B. napus* cultivar "Tower" was released in 1974 and afterwards a number of double zero cultivars were identified in different countries of the world. In India till date, the main emphasis has been to improve the rapeseed-mustard seed yield and oil content. It is necessary that seed oil quality especially the fatty acid composition also be improved wherever possible. Mustard is cultivated in mostly under temperate climates. Sulphur fertilizers have been reported to increase the seed yield and oil content of mustard (Singh *et al.*, 2013).

Sulphur has been reported to influence productivity of oilseed (Singh *et al.*, 1999). Similarly, Biswas *et al.* (1995) reported that application of S fertilizer increase the seed yield of mustard. Sulphur (S) is increasingly being recognized as the fourth major plant nutrient after nitrogen, phosphorous and Potassium. Sulphur and Zinc content and uptake were significantly higher with the application of $ZnCl_2$ as a source of Zinc in soyabean. Yasari (2012) studied the effect of applying Zn to compare the effects that incorporating them in the soil and spraying them on the soybean crop on seed oil and contents and percentages. Application of micro-nutrients like zinc, sulphur, magnesium and boron significantly increased yield. Alternaria blight is one of the major biotic limit factors for realizing quality mustard production (Singh *et al.*, 2013).

Keeping this in view there is a need to screen/develop Indian mustard varieties having low erucic acid and effect of different doses of Zinc (Zn) and Sulphur (S) on protein content, tryptophan, methionine, and allyl-isothiocynate content, mineral status of the cake and Alternaria blight severity in mustard.

[1]Department of Chemistry, Kamla Nehru Institute of Physical and Social Sciences, Sultanpur, Uttar Pradesh, India
[2]Department of Biotechnology, N. D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India
*Corresponding Author Email: hksndu@gmail.com

Review Article

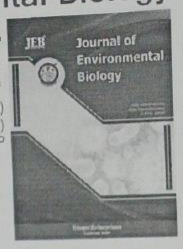
Journal Home page : www.jeb.co.in ★ E-mail : editor@jeb.co.in

Journal of Environmental Biology

JEB™

ISSN: 0254-8704 (Print)
ISSN: 2394-0379 (Online)
CODEN: JEBIDP

DOI : http://doi.org/10.22438/jeb/38/6/MS-248



Alternaria blight of rapeseed-mustard–A Review

Authors Info

H.K. Singh*[1], R.B. Singh[1], P. Kumar[1], M. Singh[1], J. Kumar Yadav[1], P.K. Singh[2], M. P. Chauhan[2], R.C. Shakywar[3], K.N. Maurya[2], B. Shainy Priyanka[1], T. Srivastava[2], S.K. Yadav[1] and M.K. Maurya[1]

[1]Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Faizabad-224 229, India

[2]Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Faizabad-224 229, India

[3]College of Horticulture and Forestry, Central Agricultural University, Pasighat-791102, India

*Corresponding Author Email : hksndu@gmail.com

Key words

Alternaria blight
Necrotrophs
Rapeseed mustard
Seed shrivelling

Publication Info

Paper received : 21.01.2016
Revised received : 14.01.2017
Accepted : 25.03.2017

Abstract

This review on Alternaria blight caused by *Alternaria brassicae, A. brassicicola and A. raphani* singly or by mixed infection is one of the most widespread and destructive disease of oilseed brassicas in all the continents. These pathogens are necrotrophs. The disease appears as black spot but later on enlarge and develops into prominent round spots with concentric rings. Many spots coalesce to form large patches showing blight and cause defoliation in severe cases. The spots on the mid-ribs of the leaves are linear and sunken. Circular to linear lesions also develop on stem and pods, which elongate at later stages. Infected pods produce small, discoloured and shrivelled seeds. This disease causes substantial yield losses as a result of several factors including reduced photosynthetic potential, early defoliation, flower bud abortion, premature ripening, siliquae dehiscence, seed shrivelling and reduced seed size, impairs seed colour and reduced oil content. This paper reviews the research on the development of Alternaria blight, describes the pathogens of Alternaria blight on rapeseed-mustard, which includes geographical distribution, economic importance, symptoms, habitat and host range, pathogen taxonomy, survival, pathogenicity and disease development, epidemiology, host resistance, breeding for disease resistance, genotypic stock, and management.

Introduction

Oilseed brassicas, also known as rapeseed-mustard *(Brassica spp.)*, is the second largest oilseed crop that contribute 32 per cent of the total oilseed production in India. Out of 75.55 m tones of rapeseed-mustard in the world from over 30.51 m ha area, India shares 7.80 m tones of rapeseed-mustard production from the area of 6.50 m ha with productivity of 1208 kgha^{-1}. (Anonymous, 2013). Among the oilseed brassicas, yellow *sarson (Brassica rapa* var. yellow *sarson)*, brown *sarson (B. campestris* var. brown *sarson)*, toria *(B. campestris* var. *toria)*, Indian mustard *(B. juncea)*, Karan rai *(B. carinata)* and oilseed rape *(B. napus)* are grown for edible oil, where as black mustard *(B. nigra)* is used as condiment and for pickle making, food preserving and spices to improve flavour, also as fodder for live-stocks. The leaves of young plants are used in the human diet as green vegetable. Mustard seed and oil has multiple uses in health care system. It improves the body complexion because of its antifungal property. It is used as a very good massage oil, which brings vitality and strength to the body and improves the circulatory system and cures bodyache. It also kills various microbes and thus, keeps skin infections away. Oral doses of oil help in strengthening the teeth and cure various mouth related diseases. It helps in healing wounds by stopping the pus formation and in curing various skin disorders by removing unwanted fluids from the body (Kumar and Chauhan, 2005). Erucic acid and glucosinolate are the two major deterrents of oil and seed meal in oilseed brassica, respectively (Singh *et al.*, 2013[3]). The oilseed brassicas usually contain 38-57% of erucic acid, 4.7-13% linolenic acid and 27% of oleic and linoleic acid, which are of high nutritive value required for human health (Singh *et al.*, 2011[4]; Singh *et al.*, 2012).

Huge volume of edible oil is still to be imported to meet the ever increasing domestic need, which can easily be met by bridging the wide gap existing between the crop potential and

© Triveni Enterprises, Lucknow (India)

178

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 731-737 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

MANAGEMENT OF ALTERNARIA BLIGHT OF LINSEED (*LINUM USITATISSIMUM* L.) THROUGH GENOTYPES AND FUNGICIDES

H.K. Singh[1], Indraman[1], J.P. Srivastava[1], M.P. Chauhan[2], K.N. Maurya[2] and M.K. Maurya[1]
[1]*Department of Plant Pathology* [2]*Department of Genetics and Plant Breeding*
N.D. University of Agriculture and Technology, Kumarganj, Faizabad -224229 (U.P.), India
E-mail: hksndu@gmail.com

ABSTRACT

Field experiments were conducted during *Rabi* 2013-14 to 2014-15 on various aspects related to the management of Alternaria blight of linseed (*Linum usitatissimum* L.), caused by *Alternaria lini* Dey and *A. linicola* (Groves and Skolko). In this endeavour total 95 genotypes including checks were screened to find out resistant sources against the disease and explore the possibilities for its economical management through newer molecules and 5 ready to use (RTU) fungicides having their different combinations. Out of 95 genotypes, none was found disease free (Immune). However, 15 genotypes (KL-31, KL-229, Polf-2, LCK-11, H-22, KL-168, KL-225, KL-221, KL-220, SJKO-17, H-12, H-15, H-43, H-5, Ayogi) showed resistant reaction having one rating in 0 to 5 scales. Likewise, 37 genotypes reacted as moderately susceptible (MS) with rating scale 3 and 13 genotypes showed susceptible reaction (Scale 4). Rest two genotypes were found highly susceptible reaction against Alternaria blight. Among the five RTU fungicides tested for their efficacy *(In-vivo)* against the disease maximum (79.45 %) disease control was worked out in the plots sprayed thrice with Mancozeb @ 0.25% on the basis pooled data of 2 years of experimentations. This treatment also resulted in maximum yield increase (196.58%) over check are water sprayed plot. However, on the basis of benefit-cost ratio maximum net return exhibited through three sprays of mancozeb @ 0.25 per cent followed Krizole (Hexaconazole 5% SC) @ 0.1 per cent.

Key words : *Linum usitatissimum, Alternaria lini and A. linicola, Alternaria blight, genotypic resistance and fungicides*

Linseed (*Linum usitatissimum* L.) is commonly known as Flax, and is a member of the genus *Linum* belonging to the family Linaceae is one of the oldest cultivated oilseed crop in the world. Among the oilseed crops raised during *Rabi* season, linseed is next in importance to rapeseed and mustard in area and production. In technical oil production India, ranks first. It is raised both for its seeds as well as fibre which is used for the manufacture of linen.

Almost every part of the linseed plant is utilized commercially, either directly or after processing. On a very small scale, the seed is directly used for edible purposes, about 20% of the total oil produced is used in farmer's homes and about 80% of the oil goes to industries in various forms, such as boiled oil, borate oil, eposidized oil, aluminated oil, urethane oil, etc. The oils is also utilized for manufacturing paints, varnishes, oilcloth, linoleum, pad ink, printers ink, soaps, patent leather and other products.

The stem yield fibre of good quality having high strength and durability. The fibre is weather resistant lustrous and blends very well with wool, silk, cotton etc. Strong twines, canvas, suiting's, shritings and various indispensable products for defense purposes are manufactured from it. Woody matter and short fibres are used as rough pulp for making paper of good quality comparable with that of currency notes. The rough, strong fibre can be effectively used for low-cost roofing tiles based on convertible polymers and for fibre-reinforced plastics based on unsaturated polyesters.

Its seed cantinas 33-47% Oil, 5.5% Linolenic acid, 20.3% Protein, 38% Fat, 29% Carbohydrate, 4.8% Fibre, 2.4% Ash in different varieties. Its oil cake is good in taste and feed for milch cattle and poultry and hence priced 50% higher than rapeseed and mustard cake.

The important linseed growing countries are India, Canada, China, USA and Ethiopia. Globally, its production was 19.23 lac tones from 22. 18 lac ha with an average yield of 867 kg/ha. While our national production was 1.47 lac tones from an area of 3.59 lac ha with poor productivity of 408 kg/ha). India rank 1st in area in the world, but is at fifth place in terms of production after Canada, China, USA and Ethiopia. In term of productivity, India (408 kg/ha) is for below to UK (1636 kg/ha), USA (1484 kg/ha), Argentina (1371 kg/ha), Canada (1197 kg/ha), Ethiopia (1065 kg/ha) and China (1029 kg/ha) (Anonymous 2012).

Amongst the various factors, behind low productivity, diseases are one of the major hurdles. The important diseases affecting the linseed crop are Alternaria blight, powdery mildew, rust and wilt. Alternaria blight, earlier designated as a minor disease has assumed greater importance in different parts of the country, especially mid eastern India. The disease caused 18-43.88% yield loss

Trends in Biosciences 10(3), Print : ISSN 0974-8431, 1168-1170, 2017

Economics of Different Treatments for Management of Alternaria Blight of Indian Mustard, [*Brassica juncea* (L.) Czern & Coss.] Under Field Conditions

MAHESH SINGH*, H.K. SINGH AND AJAY KUMAR

*School of Agriculture Sciences ITM University, Gwalior, Madhya Pradesh
Department of Plant Pathology, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, U.P.
*email: doctorsingh14@gmail.com

ABSTRACT

Field experiments were conducted at SIF in Narendra Dev University of Agriculture and Technology Kumar Ganj, Faizabad, Uttar Pradesh to assess the economics of fungicides, botanicals and bio-agents for the management of Alternaria blight of Indian mustard during 2012-13 and 2013-14. Most economical (B: C ratio of 3.60 and 3.79) scheduled was recorded in the treatment T_{12} i.e. three spray of SAAF (Carbendazim 12% + Mancozeb 63% WP) @ 0.2% were done at at 40, 55 and 70 DAS with highest seed yield (1624.60 and 1646.67 kg/ha) fallowed by treatment T_{10} (Potash @ 50 Kg/ha as basal dose) 3.06 and 3.10 with seed yield (1408.30 and 1398.43kg/ha) and treatment T_7 (Spray of Garlic bulb extract @ 2%) 2.91 and 2.95 with seed yield (1438.00 and 1424.77 kg/ha) during both years respectively. Minimum B: C ratio (0.79 and 0.78) was recorded in treatments T_4 (Seed treatment and spray of *P. fluorescence* @1%) with seed yield (1379.63 and 1366.37 kg/ha) and treatment T_{11} (Sulphur 30 Kg/ha as basal dose) i.e. 0.86 and 0.87 with seed yield (1606.47 and 1598.23 kg/ha) during both the year respectively over treatment T_{13} (untreated check).

Key words *B: C ratio, Fungicides, Botanicals, Bio-agents, Yield, Economics*

Indian mustard (*Brassica juncea* (L.) Czern & Coss.) is one of the most important oilseed crops among rapeseed mustard which is grown during *rabi*. It belongs to the family *brassicaceae*. and is mostly cultivated in Rajasthan, Uttar Pradesh, Madhya Pradesh, Haryana, Gujarat, West Bengal and Assam in India. Mustard is the second largest produced oilseed in the world with an area of 37.0 m ha, with the production of 63.09 m t. and the productivity of 18.50 q/ha (Singh and Singh, 2015). India contributes 28.3% and 19.8% in world acreage and production (Anonymous, 2013). The seed and oil are used as condiments in pickles, for flavoring curries and vegetables. Oil is used for cooking and frying purposes. It is also used in preparation of hair oil and medicine. It has industrial importance in soap making and in mixtures with mineral oils for lubrication and grease of various machines. Oil cake serves as feed for cattle, fish and poultry and as manure. Tender leaves of young plants are used as green vegetables and are good source of sulphur and other minerals in diet. The seeds are highly nutritive containing 37.7-52.9 % euric acid, 8.5-19.0 % linoleic acid and 8.6-17.1 % oleic acid (Robbelen and Thies, 1980). Alternaria blight disease caused by *A. brassicae* (Berk.) Sacc. and *A. brassicicola* (Schw.) Wiltshire is one of the most important diseases of Indian mustard, causing 47% yield losses (Singh *et al.*, 2015). The fungus attacks both vegetative and reproductive parts of the plants; therefore it causes high yield loss (Chattopadhyay, 2008). The present study was undertaken to access the yield losses due to Alternaria blight in Indian mustard by using different treatments such as Bio-agents, Plant product and fungicides.

MATERIALS AND METHODS

The experiment was carried out on seed treatment, basal application and spray schedules of different fungicides for the management of Alternaria blight of mustard, cultivars *Varuna* was sown on dated 6th November, with three replications and thirteen treatments in RBD design along with recommended package and practices during 2012-13 and 2013-14 at Student's Instructional Farm of Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad. The different treatments *viz.* T_1-Seed treatment with *T. harzianum* 10 g/kg seed, T_2-Seed treatment with *P fluorescence* @ 10 g/kg seed, T_3-Seed treatment and spray of *T. harzianum* @1%, T_4-Seed treatment and spray of *P fluorescence* @1%, T_5-Spray of *E. globosus* leaf extract @ 5%, T_6-Spray of *D. stramonium* leaf extract @ 5% T_7- Spray of Garlic bulb extract @ 2%, T_8- Spray of $ZnSo_4$ @ 0.2 %, T_9- Spray of Borax @ 0.5%, T_{10}- Potash @ 50 Kg/ha as basal dose, T_{11}- Sulphur 30 Kg/ha as basal dose, T_{12}- Spray of SAAF (Carbendazim 12% + Mancozeb 63% WP) @ 0.2% were done at 15 days interval by using knapsack sprayer. The first spray was done immediately after appearance of the disease. Treatment T_{13}-(Check) serves as untreated. The observations on yield was recorded from individual plot in q/ha. Benefit cost ratio was point out to evaluate the most economical spray among all treatments applied as different spray schedule. The benefit – cost ratio (BC ratio) was calculated on the basis of seed yield of each treatment by using the following formula (Singh, *et al.* 2014).

$$\text{Benefit-Cost ratio (B : C)} = \frac{\text{Additional income generated by the treatment}}{\text{Total cost involved in protection}}$$

RESULT AND DISCUSSION

Economics of treatments for the management of Alternaria blight of mustard

The data showed in Table-1 and Table-2 indicated that highest B: C ratio of 3.60 and 3.79 was recorded in the treatment T_{12}- three spray of SAAF (Carbendazim 12% + Mancozeb 63% WP) @ 0.2% were done at at 40, 55 and 70 DAS fallowed by treatment T_{10} (Potash @ 50 Kg/ha as basal dose) 3.06 and 3.10 and treatment T_7 (Spray of Garlic

Int.J.Curr.Microbiol.App.Sci (2020) *9*(10): 452-457

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 10 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.910.055

Studies on the Pattern of Changes in Fruiting behaviour of Ber (*Ziziphus mauritiana* Lamk.) Fruits during Growth and Development

Shiwanand Pandey* and Bhagwan Deen

Department of Horticulture, NDUA&T, Kumarganj, Faizabad U.P., India

**Corresponding author*

Keywords:
Growth, development, Peak, Pickings, Semi-arid

Article Info

Accepted:
07 September 2020
Available Online:
10 October 2020

A B S T R A C T

The present investigation entitled "Studies on changes during growth and development of ber (*Zizyphus mauritiana* Lamk.) fruit cv. (Narendra Ber Selection-1)" was carried out during the year 2016-2017. The studies comprised three experiments namely fruiting behaviour of ber. Ber flowering started from mid of September and completed at mid of November the peak period of flowering was mid of October. Whereas fruit setting took place between 3rd week of September to 1st week of December but peak setting period was last week of September to mid of October. Fruit drop and fruit retention percentage also changes during growth and development of ber fruit. Ber fruit was harvested in five pickings, and peak period of yield was first week of March.

Introduction

Ber (*Zizyphus mauritiana* Lamk.) is an ancient fruit tree of India and China. In fact it was one of the prominent fruits on which sages in ancient India lived during Vedic ages. There is a reference to ber in "Yajurved", written not later than 1000 B.C. Ber (*Ziziphus mauritiana* Lamk.) is also known as Chinese date, Chinee/Chinkee apple, jujube, Indian plum, Regi pandu, Indian jujube and masau, belongs to the family Rhamnaceae and genus *Zizyphus*. It is a tetraploid (2n=48) in nature. It is grown in countries like Iran, Syria, Australia, USA, France and certain parts of Italy, Spain and Africa. Precisely it is seen to be growing under tropical and sub-tropical as well as Mediterranean regions of the world. It grows even on the marginal soil and various kinds of waste land situation such as sodic saline soil, ravines, arid, semi-arid region including plated area of Bundelkhand and South India. Regarding its distribution it grows most widely in Punjab plains, U.P., Haryana, Rajasthan, M.P., Bihar, Maharashtra, Assam, A.P., Tamil Nadu and West Bengal. In U.P. ber orchards are found around Varanasi, Aligarh, Saharanpur, Faizabad, Agra and Raibareilly districts. However, scattered planting is common in plains. It is hardy and flourishes well under little care in wide range of soils and climatic conditions. The ripe ber fruits have high nutritive values and

The Pharma Innovation Journal 2021; 10(4): 792-798

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(4): 792-798
© 2021 TPI
www.thepharmajournal.com
Received: 01-02-2021
Accepted: 03-03-2021

Vartika Singh
Department of Fruit Science, College of Horticulture and Forestry, ANDUA&T, Kumarganj, Ayodhya, Uttar Pradesh, India

Bhagwan Deen
Department of Fruit Science, College of Horticulture and Forestry, ANDUA&T, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Vartika Singh
Department of Fruit Science, College of Horticulture and Forestry, ANDUA&T, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on changes in biochemical attributes during growth and development of ber (*Zizyphus mauritiana* Lamk.) fruit cv. (Narendra ber selection-2)

Vartika Singh and Bhagwan Deen

DOI: https://doi.org/10.22271/tpi.2021.v10.i4l.6055

Abstract
The Studies on changes in biochemical attributes during growth and development of ber (*Zizyphus mauritiana* Lamk.) fruit cv. (Narendra Ber Selection-2) was conducted during growing season of 2019-20. The fruits on tagged current season shoot were harvested at 21, 36, 51, 66, 81, 96, 111, 126, 141, 156, 171 and 186 days after fruit set. Samples were collected from Main Experiment Station, Horticulture and transported to the post graduate laboratory of Department of Fruit Science, College of Horticulture and Forestry, ANDUA&T, Kumarganj, Ayodhya, Uttar Pradesh. The objective was to probe the pattern of biochemical changes in developing ber fruits. The outcomes reveal that total soluble solids increased from 1.04% to 17.94% during 186 days of fruit growth and development whereas acidity content continuously decreased and recorded 0.39% on 21st day and 0.14% on 186th day of growth and development. Ascorbic acid content increased from 3.29 mg/100g to 90.26 mg /100g of fruit. Reducing, Non-reducing and total sugar content significantly increased from 0.22% to 4.76%, 0.11% to 5.77% and 0.35% to 10.87%, respectively. Moisture content showed decreasing trend and was maximum 71.12% on 21st day and minimum 65.79% on 186th day of observation. An abrupt decrease in chlorophyll content was recorded with growth and development of the fruit.

Keywords: Ber, Zizyphus mauritiana, NBS-2, fruit growth and development, arid fruit, dryland horticulture

Introduction
Ber (*Zizyphus mauritiana* Lamk.), the king of arid fruits, is a considerable minor hardy fruit crops symbolizing the production at a modicum cost. There are two major cultivated jujubes-Indian jujube (*Zizyphus mauritiana* Lamk., 2n=48) and Common or Chinese jujube (*Zizyphus jujube* Mill., 2n =24). Genus *Zizyphus* comprises almost fifty species, out of which 18 to 20 are local to India (Pareek, 2001) [20]. It is evergreen, small (up to 15m height), spiny tree with about 30 cm diameter trunk. Fruit is juicy drupe with 2.5cm (diameter) and 4.5cm (wide) and can be round, oval, ovate oblong or elliptical in shape. Ber is a perfect tree for arid as well as semi-arid culture and one of the most nutritious fruit crop having medicinal as well as processing potential. The ber fruit is excellent source of proteins, carbohydrates, fibers, fats, TSS, ascorbic acid, antioxidants, total phenolics, reducing, and non-reducing and total sugars (Kumara *et al*., 2015) [9]. It can be consumed as fresh or can be used in processed forms such as powder, candies, murrabbah, jams and beverages. It can tolerate salinity, alkalinity and pH as high as 9.2and even waterlogged condition upto certain extent. This crop requires less water compare to other fruits therefore, suitable fordry land farming. Successful cultivation of ber can be done even in the most marginal ecosystem of tropics and subtropics (Pareek, 2001) [20] and can tolerate extremely high temperature and are grown in region with maximum temperature of 39-42 °C. The area under cultivation of ber is extending because of its unique ability to flourish even on neglected land, specific demand, hardy nature, good return, and Indian Government policies under National Horticulture Mission.
The studies on changes in biochemical attributes during growth and development are essential requirement to determine the maturity and harvesting time in order to maintain high nutritional quality, reduced post-harvest losses as well as better marketability. Therefore, the present investigation has been undertaken to observe the changes in biochemical attributes during growth and development of recent ber variety Narendra Ber Selection-2 (NBS-2).

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3139-3147

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3139-3147
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Chemical Changes during Growth and Development of Aonla (*Emblica officinalis* Gaertn.) Fruit cv. Narendra Aonla-10

Om Narayan[1]*, Bhagwan Deen[2], Ravi Pratap Singh[2] and Vartika Singh[1]

[1]Department of Fruit Science,
[2]Department of Horticulture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India
Corresponding author

A B S T R A C T

Gradual increase was observed in total soluble solids and ascorbic acid with the advancement of maturity in aonla under northern Indian conditions. Keeping in view above facts the present investigation entitled "Studies on chemical changes during growth and development of Aonla (*Emblica officinalis* Gaertn.) fruit cv. Narendra Aonla-10" is carried out with objectives to observe the chemical changes during growth & development of fruits and the maturity index for right stage of fruit harvesting during 2019-2020 at Main Experimental Station of Department of Horticulture, A.N.D. University of Agriculture and Technology, Kumarganj - Ayodhya (U.P.). Results showed that all chemical parameter of growth and development viz- Vitamin C and total sugar increased up to maturity.

Keywords

Chemical, Fruit, Parameter, Acidity and TSS

Introduction

Aonla (*Emblica officinalis* Gaertn.) is one of the most important traditional and under utilized fruits of Indian origin, having immense potential for cultivation on marginal or wastelands. It belongs to family Euphorbiaceae and indigenous to tropical Asia. Among all the fruit crops, aonla is the richest source of ascorbic acid, except Barbados cherry. It is grown all over Asia for its nutritional, medicinal and commercial value. Wild aonla trees are also found in China, Sri Lanka, Pakistan, USA (Hawaii and Florida) and Puerto Rico. In recent years, the processing and value addition of aonla has increased many folds due to increase in its area and production. Aonla has acquired wide popularity all over the world f or its medicinal properties. Its fruits are used in traditional Indian system of medicines, like ayurvedic, due to its therapeutic values (Agarwal and Chopra, 2004).

The growing popularity for alternate medicines, health foods, and herbal products are enhancing the demand for aonla fruit. Its fruits are rich in vitamin C, protein, fat, crude fibre, starch, sugars, minerals and tannins. Because of its highly acidic and astringent nature, the consumers do not relish this fruit in fresh form (Goyal *et al.*, 2008).

AMERICAN SOCIETY FOR MICROBIOLOGY | Infection and Immunity®

MICROBIAL IMMUNITY AND VACCINES

Plasmodium falciparum Cysteine-Rich Protective Antigen (CyRPA) Elicits Detectable Levels of Invasion-Inhibitory Antibodies during Natural Infection in Humans

Syed Yusuf Mian,[a] Anjali Somanathan,[a] Kritika Chaddha,[a] Alok K. Pandey,[b,*] Hina Singh,[b] § Sri Krishna,[c] Neha Chaturvedi,[c] Seemalata Uchoi,[a] Man Mohan Shukla,[c] Praveen K. Bharti,[c] Neeru Singh,[c] Virander Singh Chauhan,[b] Deepak Gaur[a] †

[a]Laboratory of Malaria and Vaccine Research, School of Biotechnology, Jawaharlal Nehru University, New Delhi, India
[b]Malaria Group, International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, India
[c]ICMR National Institute of Research in Tribal Health (NIRTH), Jabalpur, Madhya Pradesh, India

ABSTRACT *Plasmodium falciparum* cysteine-rich protective antigen (CyRPA) is a conserved component of an essential erythrocyte invasion complex (RHS/Rip/CyRPA) and a target of potent cross-strain parasite-neutralizing antibodies. While naturally acquired human RHS antibodies have been functionally characterized, there are no similar reports on CyRPA. Thus, we analyzed the parasite-neutralizing activity of naturally acquired human CyRPA antibodies. In this regard, CyRPA human antibodies were measured and purified from malaria-infected plasma obtained from patients in central India and analyzed for their parasite neutralizing activity via *in vitro* growth inhibition assays (GIA). We report that, despite being susceptible to antibodies, CyRPA is a highly conserved antigen that does not appear to be under substantial immune selection pressure, as a very low acquisition rate for anti-CyRPA antibodies was reported in malaria-exposed Indians. We demonstrate for the first time that the small amounts of natural CyRPA antibodies exhibited functional parasite-neutralizing activity and that a CyRPA-based vaccine formulation induces highly potent antibodies in rabbits. Importantly, the vaccine-induced CyRPA antibodies exhibited a robust 50% inhibitory concentration (IC_{50}) of 21.96 μg/ml, which is comparable to the IC_{50} of antibodies against the leading blood-stage vaccine candidate, reticulocyte-binding-like homologous protein 5 (RHS). Our data support CyRPA as a unique vaccine target that is highly susceptible to immune attack but is highly conserved compared to other leading candidates such as MSP-1 and AMA-1, further substantiating its promise as a leading blood-stage vaccine candidate.

KEYWORDS *Plasmodium falciparum*, malaria vaccine, RHS, CyRPA, naturally acquired immunity, growth inhibition assay

Malaria remains a major global health challenge, accounting for 200 million cases and around 0.4 million deaths each year, primarily in children under 5 years of age (1). The disease severity and clinical manifestations are a result of the parasite's blood-stage life cycle (2, 3). Several merozoite antigens have been identified to play a critical role during erythrocyte invasion, of which *Plasmodium falciparum* reticulocyte-binding-like homologous protein 5 (RHS) has emerged as a key invasion determinant that plays an essential role during *P. falciparum* erythrocyte invasion (4, 5). Antibodies targeting RHS or its erythrocyte receptor, basigin, exhibit potent parasite neutralization *in vitro* and *in vivo* (6–10). RHS-based vaccines were found to be safe and immunogenic in a phase 1a controlled human malaria infection-based clinical trial (10–12).

The molecular redundancy associated with the highly rapid *P. falciparum* erythrocyte invasion process presents a major hurdle to achieving high antibody titers for efficacious neutralization that is unlikely to be overcome by a vaccine based on a single antigen like

Editor Anjali P. J. Gaur, Jr. Davis School of Veterinary Medicine
Copyright © 2022 American Society for Microbiology. All Rights Reserved.
Address correspondence to Virander Singh Chauhan, virandersc.chauhan@gmail.com.
*Present address: Alok K. Pandey, Agricultural Microbiology Section, Department of Soil Science and Agricultural Chemistry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, India.
§Present address: Hina Singh, Jamia Hamdard Institute of Molecular Medicine, Hamdard Nagar, New Delhi, India.
†This article is dedicated to the memory of Beloved Professor Deepak Gaur (Former Deputy Country Director of IRA, India), who passed away with COVID-19.
Received 5 July 2021
Returned for modification 23 August 2021
Accepted 27 September 2021
Accepted manuscript posted online 25 October 2021
Published 25 January 2022

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3129-3138

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3129-3138
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Physical Changes during Growth and Development of Aonla (*Emblica officinalis* Gaertn.) Fruit cv. Narendra Aonla-10

Om Narayan[1]*, Bhagwan Deen[2], Ravi Pratap Singh[2] and Vartika Singh[1]

[1]Department of Fruit Science,
[2]Department of Horticulture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India
**Corresponding author*

Keywords

Weight, Fruit, Maturity, Harvesting, Growth and Development

A B S T R A C T

Physiological maturity in aonla is mainly determined on the basis of specific gravity, ground colour, fiber content and seed colour. Gradual increase was observed in average fruit weight, stone weight, pulp weight and pulp: stone ratio with the advancement of maturity in aonla under northern Indian conditions. Keeping in view above facts the present investigation entitled "Studies on physical changes during growth and development of Aonla (*Emblica officinalis* Gaertn.) fruit cv. Narendra Aonla-10" is carried out with objectives to observe the physical changes during growth & development of fruits and the maturity index for right stage of fruit harvesting during 2019-2020 at Main Experimental Station of Department of Horticulture, A.N.D. University of Agriculture and Technology, Kumarganj - Ayodhya (U.P.). Results showed that all physical parameter of growth and development viz- length, width, weight, pulp / fiber percentage showed significant change from 6th August to 6th December and then showed non-significant change till 6th January.

Introduction

Aonla (*Emblica officinalis* Gaertn.) belongs to family Euphorbiaceae. It is indigenous to Tropical South-East Asia, particularly in Central and Southern part of India (Morton, 1960). Naturally growing aonla has been reported from Cylon, Cuba, Puerto Rico, Hawaii, Florida, Iran, Iraq, Java, West-Indies, Trinidad, Pakistan, Malaya and China (Benthal, 1946). It is being cultivated since long back and occupies an important place among indigenous fruits of India. Aonla finds mention in "Vedas, Ramayana, CharakSamhita, SushrutSamhita" literatures describing its fruit highly valuable as food, medicine and hair dye (Anon, 1964). Aonla is the second richest source of vitamin-C (500 mg/100g pulp) among the fruits, after Barbados cherry.

Aonla is one of most nutritious fruits and it is fair source of minerals particularly iron, phosphorous, calcium, magnesium and rich source in pectin. Beside these, aonla fruit has adequate amount of sugars and acids. Fresh

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3082-3090

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3082-3090
Journal homepage: http://www.ijcmas.com

Original Research Article

Determine of Maturity Index for Right Stage of Fruit Harvesting during Growth and Development of Aonla (*Emblica officinalis* Gaertn.) Fruit cv. Narendra Aonla-10

Om Narayan[1]*, Bhagwan Deen[2], Ravi Pratap Singh[2] and Vartika Singh[1]

[1]Department of Fruit Science,
[2]Department of Horticulture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India
**Corresponding author*

Keywords

Fruit, Maturity index, Harvesting, Growth and development, Aonla, biochemical attributes

A B S T R A C T

Physiological maturity in aonla is mainly determined on the basis of specific gravity, ground colour, fiber content, seed colour and TSS/ acid ratio. Gradual increase was observed in average fruit weight, stone weight, pulp weight, pulp: stone ratio, total soluble solids and ascorbic acid with the advancement of maturity in aonla under northern Indian conditions. Harvesting of fruits at proper stage of maturity is desirable for maintaining the quality and consumer acceptability. Keeping in view above facts the present investigation entitled "To determine the maturity index for right stage of fruit harvesting during growth and development of Aonla (*Emblica officinalis* Gaertn.) fruit cv. Narendra Aonla-10." is carried out with objectives to observe the physical and chemical changes during growth & development of fruits and the maturity index for right stage of fruit harvesting during 2019-2020 at Main Experimental Station of Department of Horticulture, A.N.D. University of Agriculture and Technology, Kumarganj - Ayodhya (U.P.). Results showed that all physiochemical parameter of growth and development viz- length, width, weight, pulp / fiber percentage showed significant change from 6th August to 6th December and then showed non-significant change till 6th January. Pulp / seed ratio, Vitamin C and total sugar increased up to maturity. Therefore, fruit of aonla variety NA-10 indicated maturity between 6th December to 6th January and this stage showed right stage of harvesting.

Introduction

Indian gooseberry or aonla (*Emblica officinalis* Gaertn.) is an important indigenous fruit crop of India. Botanically, fruit is a berry and its mesocarp, an edible portion. It is acrid, astringent, cooling, refrigerant, diuretic and has laxative value. The fruit is rich source of vitamin-C, pectin and tannin(Pathak *et al.*, 2003). If, the fruits of aonla are not properly mature, tannic acid, vitamin-C and other constituents may not attain the optimum level and pose heavy post-harvest losses, including desiccation, browning of skin and prone to microbes, which resulted in poor shelf life with inferior quality.

Maturity is influenced mainly by cultivars, climate, soil, cultural practices, canopy

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1369-1372

Assessment of occupational health hazards among farm workers involved in agricultural activities

Pragya Ojha and Abha Singh

Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P, India

Abha Singh
Professor, Department of Family Resource Management, College of Home Science NDUAT, Kumarganj, Uttar Pradesh, India

Correspondence
Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P, India

Abstract
Indian Farm workers are highly involved in various agricultural operations. They perform a sequential work through manual efforts. In the present investigation efforts have been made to assess the occupational risk related to various agriculture activities and to compare the physical strength of male and female farm workers, during manual method to perform agricultural operations. For the study, twenty female and twenty male subjects were selected. From this study, it has been recommended that there is dire need to create awareness among the farm workers about the low cost improved technologies related to flower cultivation which can significantly improve the livelihood security and working conditions of farm workers. It will also reduce the level of occupational risk and enhance the physical strength of the workers.

Keywords: Occupational risk, Physical strength, Agricultural Workers, Agricultural Activity

Introduction
In the context of occupational safety and health, the term 'agriculture' is generally used in a broad sense including all activities directly related to cultivating, growing, harvesting and primary processing of agricultural products, animal and livestock breeding including aquaculture, and agroforestry. Agricultural work is dangerous; workers in this industry have among the highest rates of fatalities (BLS, 2014 and Liabraa *et al.* 2013). Furthermore, Wang *et al.* (2013) also mentioned that work in agriculture involves exposures to a variety of hazards, including dust, noise, thermal stress, pesticides and other chemicals, and ergonomic risk factors. As a result, agricultural workers have elevated rates of injuries and illnesses. Das *et al.* (2011) also supported that agricultural works are associated with several occupational disorders among the farmers and agriculture farming involves several types of hazardous activities including prolonged and awkward postures. Agriculture workers perform many strenuous activities. These are: spading, carrying seeds, uprooting, transplanting saplings, harvesting or cutting crops, sheafing, carrying crops, threshing, sweeping and winnowing. Therefore, the main aim of this investigation was to know the level of occupational health hazards among agriculture workers and an attempt was made to compare the physical strength of male and female farm workers during the performance of work.

Materials and Method
Selection of subject and field
From Faizabad district of Uttar Pradesh state, India, twenty male and twenty female subjects with normal health, without any major illness or cardio-vascular problems were purposively selected because only without illness or cardio- vascular problems, agricultural workers can perform the activities more efficiently. This study was conducted in the month of February- August in the year of 2016. The age range of the selected subjects was 20-55 years. Care was taken to select the female farm workers who were not pregnant and who can perform the agricultural activities regularly. The agricultural operations were performed for 7:00 A.M to12:30 P.M. and 2:00 P.M. to 5:30 P.M. Agriculture workers performed the continuous agriculture operations for 50 minutes and taking 10 minutes break.

Calibration of subjects: The subjects were calibrated with the Body Mass Index to determine their physical fitness index. The body mass index of subjects was calculated by dividing square of height (m2) to weight (kg).

Quantification of safety and Health Hazards
Semi quantitative observational tool to characterize safety and health hazards developed by Neitzel *et al.* (2014) has been used to quantify the level of safety and health hazards among

Scanned with CamScanner

7:34

9-5-51-459.pdf

The Pharma Innovation Journal 2020; 9(6): 197-199

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(6): 197-199
© 2020 TPI
www.thepharmajournal.com
Received: 23-04-2020
Accepted: 26-05-2020

Nilam Yadav
Research Scholar, Department of Family Resource Management, Helina School of home science, Sam Higginbottom University of agriculture, technology and sciences, Allahabad, Uttar Pradesh, India.

Dr. Razia Parvez
Associate Professor, Department of family resource management, Helina School of home science, Sam Higginbottom University of agriculture, technology and sciences, Allahabad, Uttar Pradesh, India.

Dr. Abha Singh
Associate Professor, Department of family resource management, college of home science, N.D.U.A.T Kumarganj, Ayodhya, Uttar Pradesh, India.

Dr. Diksha Gautam
Guest Faculty, Department of family resource management, college of home science, N.D.U.A.T Kumarganj, Ayodhya, Uttar Pradesh, India.

Corresponding Author
Dr. Diksha Gautam
Guest Faculty, Department of family resource management, college of home science, N.D.U.A.T Kumarganj, Ayodhya, Uttar Pradesh, India

Comparative study on weight loss and volume loss of tomato under Janta cool chamber and ambient condition

Nilam Mishra, Dr. Razia Parvez, Dr. Abha Singh and Dr. Diksha Gautam

Abstract
An evaporative cool chamber was designed and constructed by using soil & river bed sand and named Janta Cool Chamber. The maximum and minimum temperature of inside and outside of the chamber was recorded for 76 days. It was observed that the inside temperature was 3-4°C lower than outside temperature. A comparative study was made to determine weight loss and volume loss of tomato inside the Cool Chamber and in the ambient condition. The Janta Cool Chamber does not require any mechanical or electrical energy input and can be constructed with locally available materials and build by unskilled Labours. It proven economical as it can store the tomato for longer period with no significant loss in quality to tomato stored.

Keywords: Janta cool chamber, storage structures, weight loss, volume loss, tomato

Introduction
Tomato is one of the most important vegetables grown in India. Post-harvest storage of tomato is the major cause of seasonal fluctuation in availability, deterioration in quality and other socio-economic inadequacies. Deterioration of fresh tomato can result from physiological breakdown due to natural ripening processes, water loss, temperature injury, physical damage, or invasion by micro-organisms. All of these factors can interact and all are influenced by temperature. Fresh fruits, vegetables and flowers are highly perishable because they are alive. They breathe (just like humans) release heat from respiration and consequently, loose moisture, which may cause weight loss, volume loss and also nutritional quality.
Maintenance of air-conditioned structures /appliances in villages is not possible for farmers due to high energy consumption and erratic supply of electricity. The cold storage facilities, confined to rural areas only are not so popular among the farmers. Evaporative cooling method of storage has been found to be an efficient technique to increase the shelf life of stored foods by reducing weight loss and volume loss. Vakis (1981)[5] also developed a cheap cool store in Kenya, with the help of local grass for the storage of vegetables. He kept the roof and walls wet by dripping water from the top of the roof. Roy and Khanda (1986) [7] constructed an evaporative cooled structure for the storage of the fruits and vegetables with a double wall made of baked brikis chamber fulfils and all these requirements and is helpful to small and people at household level in rural areas.
Mukharjee *et.al* (2008) [6] studied on comparative study of fruits and vegetables in cool chamber and in ambient. In the study an evaporative cool chamber was constructed with the help of baked bricks and river bed sand, maximum and relative humidity were recorded inside and outside the chamber for one month. Weight loss and freshness were observed every day. It has been recorded that weight loss of fruits and vegetables kept inside the chamber was lower than those stored outside the chamber.
In the present study of Janta Cool Chamber was made to store the horticultural produce for a short period of time. The principle of working of this cool chamber is based on technique of evaporative cooling. This maintains low temperature and relative humidity in low temperature and relative humidity in the inner space compared to the ambient condition. This Janta Cool Chamber fulfils all these requirements and is helpful to small farmers and people at household level in rural areas.

Methods and Materials
The present study was conducted at Helina School of Home Science, Sam Higginbottom

Scanned with CamScanner

The Pharma Innovation Journal 2021; SP-10(7): 222-225

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(7): 222-225
© 2021 TPI
www.thepharmajournal.com
Received: 19-05-2021
Accepted: 21-06-2021

Swapnil Singh
M.Sc. Research Scholar, Department of Family Resource Management and Consumer Science, College of Community Science, ANDUA and T, Ayodhya, Uttar Pradesh, India

Poonam Singh
Assistant Professor, Department of Family Resource Management and Consumer Science, College of Community Science, ANDUA and T, Ayodhya, Uttar Pradesh, India

Abha Singh
Associate Professor, Department of Family Resource Management and Consumer Science, College of Community Science, ANDUA and T, Ayodhya, Uttar Pradesh, India

Corresponding Author
Swapnil Singh
M.Sc. Research Scholar, Department of Family Resource Management and Consumer Science, College of Community Science, ANDUA and T, Ayodhya, Uttar Pradesh, India

Value addition techniques used for strengthening of bags

Swapnil Singh, Poonam Singh and Abha Singh

Abstract
Value addition techniques are used on bags of old clothes and plastic sheets. Colour combination has been used to enhance the beauty from ancient time. It is believed that strength of bags by lining jute cloth and synthetic sheets were developed earlier than the use of bags itself, used value added materials is the knowledge, selection and application of the basic knowledge of durability of cloth. The present study was conducted to stitch bags that were suitable for value addition materials. Thirty value added bags were identified for application in old cloth and thick plastic works. Created works got evaluated from 100 respondents including both experts and consumers. 5 top ranked value added techniques used on bags were selected from each category.

Keywords: value addition, bags, plastic, pollution

Introduction
Plastic pollution is a problem all over the world. Each year at least 8 million tons of plastic find their way into the ocean. The problem is equivalent of dumping the contents of one garbage truck into the ocean every minute. Plastic shopping bags, carrier bags or plastic grocery bags are a types of plastic bag used as shopping bags and made from various kinds of plastic in use by consumers worldwide since the 1960; these bags are sometimes called single use bags, referring to carrying items from a store to home. Shopping bags are medium - sized bags typically ground 10-20 liters (2.5-5 gallons) in volume (though much larger version exist, especially for non-grocery shopping); that are used by shoppers to carry home, their purchases. Some are intended as single - use disposable products though people may reuse them for storage or as bin liners etc. Others are designed as reusable shopping bags. Reusable shopping bags are a kind of carrier bag, which are available for sale in super markets and apparel shops. In a 2011 study of 4.5 retail chain (Funded by a Pro - business group that opposes plastic bag bans), 23% of reusable bags were found to have levels of lead that were higher than the 100-ppm standard considered safe for product packaging though did not present a risk of contaminating food. Plastic consumption has become an integral part of our daily life. The complication in the existing reusable bag for shopping for a particular item along with its methodology is broadly discussed providing an ideal solution.
BYOB basically stands for "Bring your own Bag." Thus, bringing one's own bags to the grocery store, and having those bags visible while shopping could motivate more "green" choices by activating a broad goal to gain social approval or a goal to help the environment.
This makes a switch in alternatives like cloth bags, jute bags or eco-friendly bags made out of natural starches and vegetable wastes instead of plastic bag, whenever you visit the Kirana shop or a vegetable market. Stash away reusable bags in your house, care for it, is come handy without having any extra load on the health of mother earth. A company in Indonesia has created a plastic bag so ecofriendly you can eat it. It's made out of Cassava, the vegetable root which is a staple in the diets of many in Africa, Latin America and Asia, but which can also be used in manufacturing. The company Avani eco based in Bali has created a bag that they say looks and feels like plastic but is completely bio- degradable and compostable it also dissolves in water, so if animals eat it, it won't cause any harm. They say it's so safe, in fact that humans could even swallow it. Bags are also a form of storing commodities and these complement the overall appearance of the storing capacity. The selection of above treatment mainly depends on functionality, color combination, designing attributes, embellishment technique, texture.

Research methods
Various value addition bags were stitched from different material. From the collected material,

Scanned with CamScanner

4:51

IJMRA-12885.pdf

International Journal of Research in Social Sciences
Vol. 7 Issue 12, December 2017.
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

ASSESSMENT OF MUSCULO-SKELETAL DISORDER IN FLOWER PLUCKING WOMEN IN FAIZABAD DISTRICT OF UTTAR PRADESH

MANEESHA MISHRA *

Dr. ABHA SINGH **

ABSTRACT

Women play a significant and crucial role in Agriculture development, livestock production and Floriculture as a manager decision maker and skilled farm worker. In this study attempt has been made to study the role performed by farm women engaged in floriculture and to find out the MSD (Musculoskeletal disorder) and OH (Occupational Hazard) among women. The study was conducted in Faizabad District in U.P. 100 samples were taken of women involved in flower management. It was found from the study that majority of respondents (40%) suffered from the Back pain while (20%) women suffered Knee pain. The analysis of the study shows that Poor postures and finger nodes. Stress full work, unawareness of new techniques in the use of equipment and unwariness for safety measures were the reason for musculoskeletal discomforts. 70% women used foot wears due to the awareness of the advantages of it. The preferred activities by women were grading of flower (42%) as first followed by Deeping of flowers (34%), plucking of flower (12%) and storage flower (11%) respectively. The study will be use full in policy making designing women friendly implements for flower plucking and right posture training.

Key words: MSD (Musculo-Skeletal Disorder), Occupational Hazard, Knee pain, Back pain, Musculoskeletal Disorder.

* Research Scholar, Department of Home Science, Family Resource Management, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad-211007, U.P., India.

** Associate Professor Department of Home Science, Family Resource Management, Narendra Deva University of Agriculture & Technology Narendra Nagar (Kumarganj), Faizabad (U.P)

Scanned with CamScanner

The Pharma Innovation Journal 2021; SP-10(7): 220-221

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2021; SP-10(7): 220-221
© 2021 TPI
www.thepharmajournal.com
Received: 16-05-2021
Accepted: 18-06-2021

Swapnil Singh
M.Sc. Research Scholar, Department Family Resource Management and Consumer Science, College of Community Science, A.N.D.U.A. & T., Ayodhya, Uttar Pradesh, India

Poonam Singh
Assistant Professor, Department Family Resource Management and Consumer Science, College of Community Science, A.N.D.U.A. & T., Ayodhya, Uttar Pradesh, India

Abha Singh
Associate Professor, Department Family Resource Management and Consumer Science, College of Community Science, A.N.D.U.A. & T., Ayodhya, Uttar Pradesh, India

Corresponding Author:
Swapnil Singh
M.Sc. Research Scholar, Department Family Resource Management and Consumer Science, College of Community Science, A.N.D.U.A. & T., Ayodhya, Uttar Pradesh, India

Impact of shopping bags on environment by users of plastic shopping bags

Swapnil Singh, Poonam Singh and Abha Singh

Abstract
Plastic bag users are at risk of numbers of health hazards. The study indicates with regards to awareness of hazards associated with the usage of plastic bags among people and their perception towards the conscious of the access of plastic bag. This study was conducted in Acharya Narendra Dev University of Agriculture and Technology Kumarganj, Ayodhya. Data was collected by interview and judgment based in each of the selected respondent using interview schedule and judgement schedule for judging the awareness schedule of health hazards by the respondents.

Keywords: health hazards, plastic bags, environment

Introduction
The world plastic comes from the Greek word plastikos, which means "able to be shaped or molded". Molding and shaping plastic by using heat is a basic part of its manufacturing process. Plastic bags have been introduced in 1970's and gained an increasing popularity amongst consumers and retailers. They are available in huge numbers and varieties across the world. Plastic industry is one among the rapidly growing industries in India. The production of plastic has reached 8.5 million tons in 2013 with a growth rate of 8% over the previous five years. The growth rate is expected to be 10% over the next five years. The reason for popularity for using the plastic bags are light weight, resistance to degradation (by chemicals, Sunlight and bacteria), durability and above all low cost.
Plastic bag packing for hot edible items causes migration of harmful chemicals to food. These include styrene which is carcinogenic, phthalates and bisphenol these chemicals cause diabetes and diseases of the heart and liver. Plastics are not only dangerous towards human health but also making survival impossible for other flora and fauna on planet earth.

Materials and Methods
This study was undertaken in 2020 in the A.N.D.U.A.&.T. Kumarganj, Ayodhya. The sample size for the study was aimed at 100 respondents including both experts & consumers. A written informed consent was taken from each participant. Socio demographic information viz age, educational status and occupational status were inquired from each participant. Questions regarding frequency of usage of plastic bags and what do they do or how do they dispose the bags after every usage were asked. They were also enquired about that they felt was the reason for popularity of plastic bags, whether they were habituated in demanding the bags more than the actual requirement from shop keepers or o whether the shop keepers, generously; offered them the bags without checking their actual requirements and whether they were habituated in refusing plastic bags by carrying their own bags for shopping visits. The questions on their awareness regarding hazards and types of hazards associated with plastic bag usage, awareness about recyclable plastic bags, awareness regarding eco- friendly alternative material for making bags and environment protection were inquired.

Statistical Analysis: The bags were coded from A_1 to A_{10}. The responses were marked in the interview schedule. The data was coded, tabulated and calculated in term of frequency and percentage.

Frequency: The no. of respondents marked in any particular parameter is its frequency.

Percentage: It is calculated by dividing obtained score by the total score and multiplying it by 100.

Scanned with CamScanner

The Pharma Innovation Journal 2021; SP-10(8): 584-586

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 584-586
© 2021 TPI
www.thepharmajournal.com
Received: 12-06-2021
Accepted: 24-07-2021

Dr. Alpana Singh
Assistant Professor, Home Science, Deenanath Pandey Govt. Women P.G. College, Deoria, Uttar Pradesh, India

Sarita Srivastav
Assistant Professor, Community Science ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Dr. Alpana Singh
Assistant Professor, Home Science, Deenanath Pandey Govt. Women P.G. College, Deoria, Uttar Pradesh, India

Impact of mass media on academic achievement of school going adolescent in Varanasi city

Dr. Alpana Singh and Sarita Srivastav

Abstract
Mass media is a type of communication means, which is used to reach large numbers of population via newspaper, radio, magazine and television. Academic achievement is a simple word that denotes status of achieving educational goals by students, decided by teacher through formal or informal tests. This study done with the objective, to find out the impact of mass media exposure and contribution of mass media on academic achievement of selected group. 200 boys and 200 girls of 15-19 years of age group from 8 schools of Varanasi city were selected for the study. Study reveals that there is significant impact of mass media exposure on academic achievement and significant contribution of mass media on achievement was found on male and Female intermediate students of Varanasi city.

Keywords: mass media, academic achievement, school going adolescent

Introduction
The term mass denotes great volume, range or extent of people or production, while communication refers to the giving and taking of message, the transmission and reception of message. The term mass media refers to the organized means for communicating openly and at a distance to many receivers within a short space of time. Mass media transfer knowledge more effectively to large number of receivers at multiple points irrespective of the distance between source and the receiver.

Mass media has prominent importance for developing country like India, such countries face number of problems. They have to find out their solutions and communicate it to the people, about four to five decades ago this was not possible, but with advent of mass media as an effective means of propagation and communication it has been achieved. Mass media have created a media audience which is now more conscious about learning and knowing.

The academic achievement is the end product of the instructions. It is a desirable learning that is observed in the learner. Any behavior that learned is achievement. It is learned amount of knowledge, understanding and acquisition of skills. Academic achievement is the task oriented behavior that allows the individuals performances to be evaluated according to some internally or externally imposed criterion that involved the individual in competing with others or that otherwise involves some standard of excellence. Academic achievement is level of attainment or performance in academic work measured by standard test or teachers or both. Good (1973) has defined academic achievement as the knowledge attained or skills developed in the school subjects, usually designated by test scores or by marks assigned by teachers or by both.

In school situation academic achievement generally means the quality and quantity of master the curriculum by students. In present study academic achievement was conceived in terms of percentage of marks obtained by the students in their previous class examination and teachers rating about the students.

Objectives of the study
Without good objective researcher cannot achieve their goal. The present investigation was designed with specific objectives:

1. To find out impact of mass-media exposure on male and female intermediate students on academic achievement.
2. To find out contribution of mass media exposure on academic achievement of male and female intermediate students.

Plant Archives Vol. 19 No. 2, 2019 pp. 3705-3706 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS OF MUSTARD (*BRASSICA CAMPESTRIS*) UNDER DIFFERENT FARM SIZE GROUPS

Ajit Verma[1], Sarita Srivastava[2] and Anil Kumar Singh[3]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The present study consisting the economics of mustard (*Brassica campestris*) in different farmers group during 2012-13 in Ghazipur district of U.P., Comparing with local check. It was found that yield was increasing more and more from smaller to large farmers on demonstrated field because they adopted advance package of practices thoroughly and properly, but the same farmer whenever of they fallow traditional practices their yield was goes down. There were a wide range of differences in Benefit Cost ration in demonstrated and local ones. There should be a chance to maximize the profit and minimize the cost in future to make a proper attention for this crop.

Key Words: Farmers, yield, increasing trends, groups

Introduction

Mustard yield the most important edible oil. The content of the seeds or different farms ranges from 32 to 50 percent. The oil obtain is the main cooking medium in our country, which cannot be easily replaced by any other edible oil. The seed and oil are used as condiment in the preparation of pickles and for flavouring curries and vegetables. The leaves of young plants are used as a green Vegetable. This crop requires relatively cool temperatures for satisfactory growth. Mustard are grown normally in the *Rabi* Season from September to October in our country which requires light to heavy loan soils. Higher yield Indian mustard of higher rate of isoproturon as a pre planting might be due to efficient weed control at initial crop growth stage, reducing crop-weed competition for inputs and creating better atmosphere for good plant growth oil seed crops more bio fertilizer, Sulphur and Nitrogen for their oil and protein synthesis causing increase in the yield and quality of oil seeds. Chauhan *et al*., 1994. More number of plants compensated the loss in seed yield due to less plant stand. The straw yield was significantly more under narrow spacing resulted large number of primary and secondary branches or plant under wider row spacing in brown Sarson (*Brassica campestrix*) affected the yield and quality Bali *et al*., 2000.

Materials and methods

The present study was conducted in randomly selected Village Govindpur of Mardah Block in Ghazipur district of Uttar Pradesh during 2012-13 with the help of farmers Scientist collaborations. Two farmers from each small, medium and large size groups has been randomly selected. Suggested Kranti variety of mustard along with seed rate 5-00 Kg./ha, N:P:K application was @ 120:40:40 Kg./ha. The crop was taken on the farmers during first fort night of October, also suggested for better yield and good response apply Sulphur @ 15 to 20 Kg./ha. Emphasis has been given an intercultural operation to avoid dense plant populations. Higher seed yield obtained when the planting distance are maintained properly. The age of seedling is an important factor better growth and vigour of the plants, Momoh *et al*., 2000. All information's has been collected through survey method and tabular analysis is being used. Family schedule has been used to collect the data regarding family size, area of the crop, expenditure and incomes etc. A comparative study has also been made through their local check along with their traditional

Plant Archives Vol. 19 No. 2, 2019 pp. 3525-3526 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE COST AND RETURN OF PIGEON PEA (*CAJANUS CAJAN* L.) UNDER DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2] and Anil Kumar Singh[3]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The present study has been taken on cost and return of Arhar (*Cajanus cajan* L.) in different size of holdings during 2012-13 in Ghazipur district of Uttar Pradesh village and farmers has be en selected on random basis. It was found that when the farmer was adopt old practices they have got low yield and low returns. Whenever, the same farmers applied all the scientific package of practices their yield and net return was on higher side. It is therefore to say that in future if the farmers apply all the scientific practices properly and timely their yield and net return becomes much more and higher.

Key Words: Farmers, Yield, Demo, Local Check, Specific.

Introduction

This crop is extensively used as dal; its green pods may be used as vegetable. The green leaves and top of the plants are fed to animal. Dry stalks obtained after threshing are used for basket making etc. Being deep rooted, it is also planted as a soil renovator to break up the hard subsoil and as a hedge to check erosion. The heavy shedding of leaves adds considerable organic matter to the soil. The crop can grown best on well-drained, light to medium soils, most and deep enough to permit a free development of roots. The plants cannot with stand frost. Good drainage is an essential requirement, as the crop cannot stand lodging. Though perennial, this crop is invariably grown as an annual crop. The crop may be due to their tall growing nature dense population and standing in the field for a long while yield of Arhar (*Cajanus cajan* L.) Crop in inter cropping system will be reduced due to competition occurs by inter crop for nutrients etc. by Rajput *et al.*, 1989, Significant reduction in the yield in delayed sowings along with dense plant population giving a small loss in the grain yield, Shankar Lingappa *et al.*, 1989. For a better yield and quality timely sowing along with proper spacing is most important.

Materials and methods

The present study has been taken in the randomly selected village Naseerpur of Block Devkali in the Ghazipur district of Uttar Pradesh during 2012-13. Two farmers has been randomly selected from each small, medium and through large size of holdings. A proper farmers scientist attention was made in the visions. Narendra Arhar-1, variety was suggested for this programmes, along with allow to apply 15 Kg/ha of Seed with a dose of N:P:K:Sulphur @ 15:40:0:20 Kg/ha for better yield. The crop was taken on the field during second fort night of July, line sowing was suggested on ridges for higher yield with better quality. All advance packages of practices has been specify for timely application. For a comparative study same farmer has to advise that they were take in other field for this crops on their own traditional practices to see that what was the difference between scientific and traditional practices. Survey method has been used to collect the data and tabular analysis was being used. Family schedule has been used to collect the data from the selected farmers according to their size of holdings, family size, area of the production and income of the crop etc sharp decrease in the grain yield of Arhar (*Cajanus cajan* L.) during the raining is more and proper drainage system when

Plant Archives Volume 20 No. 2, 2020 pp. 8995-8996 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS OF CHILLI *(CAPSICUM ANNUUM)* ON DIFFERENT FARM CONDITIONS

Ajit Verma[1], Vinay Kumar Singh[2], Anil Kumar Singh[3], Ashok Kumar Singh[4] and Sarita Srivastava[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.

Abstract

The main objective of the present study was to study the Economics of Chilli in the randomly selected farmers of villages in Ghazipur district of Uttar Pradesh, India. It was found that farmers has adopted all the advance package of practices and applied time to time during the cropping time resulted good yield and high net incomes. In future it will also be improved whenever they use better crop management practices with high profile business thinking.

Key Words: Village, Yield, Farmers, Specific, Trends, Exhibits.

Introduction

Chilli also called 'red pepper' is an important cash crop in India and is grown for its pungent fruits, which are used both green and ripe (the latter in the dried form) to import pungency to the food. As a condiment, it has becomes indispensable in every Indian home. It is also used medicinally, and in chantries and pickles. Capsicum plants are herbaceous or semi woody annuals or perennials very high rainfall during its growth is harmful. Under irrigation and good manuring, excellent crops can be raised in sandy and light alluvial loans as well as in red loamy soils. As a garden crop, it is sometimes allowed to grow as a stand-over crop for one or two seasons. The land is ploughed and harrowed 3 or 4 times to obtain a fine filth. Recommended dose of FYM is better for good yield and better qualities. The Chilli is generally transplanted, through direct sowing. Foliar spray of Zinc and Iron not increase the yield and quality of the crop Pillai and Vadivelu (1967). The combined spray of Zinc, boron and iron through soil or its foliar Spray is better for good yielding; Saryandrayra and Hariprasad (1985) reported that these micronutrients increased the green yield of Chillies. Hosmani and Hosmani (1993) give details about Chillies in their second edition. Seeds taken from healthy, well matured fruits selected for the purpose are mixed with ashes and shown evenly in well-manured nursery beads. The nursery treatment and other recommended practices had been taken at the time of their requirements.

Materials and Methods

The present study was conducted on the field in Ghazipur district of Uttar Pradesh, India in randomly selected two villages namely Bishunpura (Block-Karanda) and Secondly Gajpatpur (Block-Berno) through farmers-scientist collaborations ranging small, medium and large size farmers groups. Seven farmers from each groups has been selected randomly. Pusa Sadabahar Chilli Variety has been offered for the demonstrations. Allowed 1 Kg. seed for a hectare to maintain line to line distance about 50 Cm and plant to plant distance 45 Cm. The crop has been taken on the field on the field during August-September. All the package of practices has been introduced to the farmers for their better yield and qualities regarding time to time applications. All the information has been collected through survey method and tabular analysis was being used. Family schedule has been used to collect the data regarding family size, area of the crop, expenditure and net income. Emphasis has been given on cultural operation irrigation and other recommended practices for the upliftment of the crop.

Plant Archives Vol. 19 No. 2, 2019 pp. 3653-3654 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE YIELD AND PROFIT OF LENTIL (*LENS CULINARIS* L.) UNDER NUMBER OF FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2] and Anil Kumar Singh[3]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main aim of the present study to judge the yield and profit of Lentil in different Size of the farmers in Ghazipur (U.P.) during 2012-13. It was found that farmers of all size groups applied all the recommended package of practices and utilize its timely therefore their yield and net return better in comparison to precious years. Their yield and net return becomes more in future if they also alert to attained the fruit full advice and implement it time to time.

Key Words: Farmers, Yield, Small, Medium, Large Size groups.

Introduction

Lentil is grown as a cold weather unirrigated Crop. When sown rather late, apply, one irrigation. Sometimes, it is grown mixed with barley and mustard or with both. Unripe pods are used as a green Vegetable and dry leaves, stalks, husk and broken grain as cattle feed. The crop is like light loams and alluvial soils. It resembles grain a great deal in plant habit and cultivation requirements. The crop normally receives no manure, weeding or intercultural. The crop matures during 120 to 125 days. This pulse crop also responds to Rhizobial inoculation. The yield of lentil increases due to irrigation in the absence of winter rains, if the raining is in winter than the yield has been goes down reported by Saxena *et al*., 1973. Whenever phosphorus applied in legumes enhances the activity of Rhizobia resulted root development consequently rise. Nitrogen Fixation in the root nodules and improve the plant growth and if quality reported by Choudhary *et al*., 1974. The application of phosphorus significantly increased the grain and straw yield.

Materials and methods

The present study has been conducted in randomly selected village Dhamupur of Jakhaniya block with farmers scientist collaboration in Ghazipur district of Uttar Pradesh during 2012-13. Four farmers from each has been randomly selected through small, medium and large size groups. The Narendra Masur-1 (*Lens culinaris* L.) variety has been suggested, seed rate 60 Kg/ha along with N:P:K:S @ 20:60:40:20 Kg/ha for better responses. The crop was taken on the field during fist fort night of November Irrigation and Kaolin spray has been recommended at the time of their need, resulted for better grain yield and straw yield also better for their growth and developments Murari et.al. 1984. All the information has been collected through survey methods and tabular analysis was used. Family schedule has been used to collect the data for the size of holdings, size of family, area of the crop production and net returns etc. All other package of practices has been given to the farmer at the time of Crop needs.

Results and Discussion

The Table 1 shows that Grain yield Qt./ha. was 16 Qt., 18Qt., 20 Qt. and straw yield 24 Qt., 30 Qt. and 38 Qt. ranging from smaller to large size of farmers, exhibits increasing trends. It is clear that farmers has already being alert about to apply all the recommended package of practices time to time resulted better yield in all size group of the farmers. Application Kolin Spray and irrigations timely was helpful to increase the yield. The Table 2 show that the gross cost Rs./ha was Rs. 14,850, Rs. 16,200, Rs. 18,370, Gross return Rs. 48,200, Rs.49,150, Rs. 52,680 exhibits increasing trends while net return was

Plant Archives Vol. 18 No. 2, 2018 pp. 2543-2544 e-ISSN :2581-6063 (online), ISSN :0972-5210

Short Communication

STUDY AND ANALYSIS OF INCOME AND EXPENDITURE LEVEL OF POTATO (*SOLANUM TUBEROSUM*) UNDER DIFFERENT SIZE OF HOLDINGS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

The main objective of the present study was to work out the income and expenditure level of potato by the use of bio fertilizer along with organic and inorganic fertilizer also in randomly selected villages of district Ghazipur, U.P. during 2011-12. It was found that yield and net return was increased from smaller to large farm ranges increasing trends under demo and local checks. Benefit cost ratio also ranges increasing from smaller to larger ones. The study concludes that yield and net return was increased only due to proper use of organic and bio fertilizer management. this study further concludes that in future more better use of organic and bio fertilizer management produces more yield and better net return in all size groups.

Key words: Yield, bio fertilizer, increasing trends.

Introduction

The potato crop has a special value as food. Potato belongs to the family Solanaceae. It occupies the largest area under any single vegetable in India. The consumption of potato per head in our country is not very much highered in comparison to others. This crop needs irrigation at frequent intervals. Five to six irrigations are sufficient. Potato tubers are planted either whole or cut into pieces sowing time is mid of September to the first week of January. Where crop has been sown in plains of the Northern area. Two successive crops can be raised on the same land. Organic manures as play very much important role in the production of yield and quality. This should be put into the soil 3 to 4 weeks before planting 80 Kg. of Nitrogen, full dose of phosphorus and full dose of potash will be incorporated into the soil as basal dressing, rest 40 Kg. of nitrogen should be apply as top dressing at the time of first earthing. Use of proper planting measures resulted to protect the crop from late blight and insect pest etc. Application of good quality of organic manure or FYM along with recommended doses of NPK provides significantly higher yield and better quality reported by Emin Caliskan *et al.* (2004). Organic manures not only been responsible for adding the natural sources of NPK but it play an important role to improve the physical and chemical properties of nutrient, deficiency in the Soil which improves higher tuber yield said by Rouat and Neyroud (2003). The tuber and their size has been increased when they have got sufficient amount of nitrogen because this is one of the very much most important food as well as Vegetable (crops in our country which is responsible for producing better calories and weight in comparison to others, Application of herbicides or hand weeding resulted higher tuber yield.

Materials and Methods

The present study was conducted along with farmers scientist collaboration in randomly selected village and block namely Sepah of Kasimabad Block. The study has been taken during the Season of 2011-12 in Ghazipur district of Uttar Pradesh. Three farmers have been selected on random basis under small, medium and large size of holdings. The main motto was to increase their production with better quality and also suggested them to compare the advance practices along with local ones.

Plant Archives Volume 20 No. 2, 2020 pp. 8463-8464 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS AND BENEFIT COST RATIO OF BRINJAL AT DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2], Vinay Kumar Singh[3], Ashok Kumar Singh[4] and Anil Kumar Singh[5]

[1]Department of Farm Management, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, KrishiGyan Kendra, Deoria (U.P.), India.
[3]Department of Horticulture, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main objective of the present study was to analysis the economics and benefit cost ratio of Brinjal in two villages of Ghazipur district of Uttar Pradesh, India. It was found that the farmers of all selected randomly groups has been taken the crop on their field through a good advance package of practices, therefore their yield and net return in all size groups increased respectively in time. The study concludes yield and net return should be increased in future if they go through a good farm plans along with better crop management systems.

Key Words: Village, Farmers, Yield, Income, Farm plans.

Introduction

Brinjal (*Solanum melongena* L.) is warm season crop its plant not with stand frost the main sowing season being during July-August for a good yield 20-25 tons of FYM per hectare incorporated into the soil at the time of field preparation. It is necessary to maintain an even moisture supply in the soil; over watering is as harmful as insufficient irrigation. In this crop, phomopsis wilt is the most important fungal disease and is seed borne. Hot water treatment of the Seed helps to reduce the incidence of the disease. Little leaf is caused by mycoplasma and can be partially controlled with antibiotics. Brinjal is prone to attack by many damages caused by insects, pests, fungus, bacteria and viruses Purohit ML and Khatri AK (1973). Brinjal productions area consistently and extensively damaged by brinjal fruit and shoot borer and other fruit borer insects reported by Kuppu Swamy and Balasubramanian (1980). To reduce pest linked damage in brinjal as well as to protect the environment from adverse effect of pesticides, as an insect resistance management strategy Ghosh *et al.*, (2003). In India brinjal is the major source of profitable income for farmers because of local demand and it is a perennial crop so that fruit can be harvested throughout the year. A large number of brinjal varieties and hybrids are grown by small, medium, large size of farmers throughout the year.

Materials and Methods

The present study was conducted in two randomly selected villages namely Jaitpur (Block-Sadar) and secondly Gaura (Block-Sadat) in Ghazipur district of Uttar Pradesh, India with farmers Scientist Collaborations in demonstrated groups small, medium and large size while selected randomly seven farmers from each groups Narendra hybrid Baigan-1 has been suggested seed rate 500-600 gram per hectare during field preparations 25 tons of FYM allowed to the soil planting distance line to line 60-75 cm and plant to plant are 45-60 cm, was proposed. Crop was taken on the field during July-August Season N:P:K @ 100:50:25 Kg/hectare for better quality and better yield advised. All the advance package of practices has been specify for timely whenever needed. Survey method has been used to collect the data and tabular analysis was being used. Family schedule has been used to collect the data from the selected farmers according to their size of holdings, family size, area of the productionand income of the crop etc. The economics has been calculated at their current price rates.

Plant Archives Vol. 17 No. 2, 2017 pp. 1343-1344 ISSN 0972-5210

STUDY THE YIELD AND ECONOMICS OF HIGH YIELDING WHEAT IN COMPARISON WITH LOCAL ONES AT DIFFERENT FARMS LEVELS

Ajit Verma[1], S.P. Singh[2], Sarita Srivastava[3], Vinod Singh[4] and Avinash Kumar[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Director Extension, Narendra Deva University of Agril. & Tech., Kumarganj, Faizabad (U.P.), India.
[3]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.
[5]Ph.D., Narendra Deva University of Agril. & Tech., Kumarganj, Faizabad (U.P.), India.

Abstract

The objective of present study was to work out yield and economics of high yielding wheat in compare with local cheque at different farm levels in randomly selected village Chariyan Khas of Deoria District, Uttar Pradesh during 2011-12. It was found that on demonstrated track by applying advance package of practices yield and net return was increased but, it was not in local cheques due to lack of technical knowledge's, lack of awareness etc. Benefit Cost ratio in both shows no specific trends. Finally it will confine that there should be a more chance to increase their yield and net returns with low cost by making to apply a good frame of advance package of practices, go through a good farm plan timely.

Key Words: Farmers, time, yield, increasing trends, package of practices.

INTRODUCTION

The wheat crop requires a well-pulverized but compact seed bed for good and uniform germinations. There are four ploughings in the summer, repeated harrowing in the rainy season, followed by three or four cultivations and planking immediately before sowing produce a good, firm seed bed for the dry crop on alluvial soils. Timely Cultivation and conservation of moisture are essential. It is second important food crop being next to rice and contributes to the total food grain production to the extent of about 25 percent wheat straw is used for feeding the cattle. The Indo-Gangetic plains form the most important wheat area. The cool winters and the hot summers are very conducive to a good crop of wheat. Well drained loams and clayey loams are considered to be good for wheat. However, good crops of wheat are raised on sandy loams and the black soil also. Sowing with seed drills, whether tractor drawn or bullock drawn, will deposit the seed at a uniform depth, give a uniform stand and lead to the early emergence of vigorous seed lings. For better yield and quality it requires a balance dose of NPK 30 ton per hectare FYM needed at the time of preparation. In some soils, zinc is becoming deficient, resulting in poor yields. In moderately deficient soils, 25 kg. of zinc sulphate per hectare is sufficient. In a cropping system involving the rice wheat rotation, it is advocated that all the potash needed under this system should be given to the rice crop and all the phosphorus to the wheat crop and nitrogen to both the crops. By addition zinc significant improvement in grain and straw yield has been observed because zinc enhances the cation exchange capacity of roots where nitrogen is responsible for higher protein content of wheat Said by Malakouti *et al* (1998). Thus, application recommended doses of NPK along with zn to wheat resulted letter flowering and fruiting also obtaining higher productivity along with significant increase in net returns reported Sharma, P.K. *et al* (2000). The seed used for sowing should have a good germination capacity and it should be healthy and freeform seed borne diseases and seed of wheats.

Materials and Methods

This study has been conducted in randomly selected village Chanyonkhas of Gauri Bazar Block in Deoria district of Uttar Pradesh during the year 2011-12. Eight farmers has been selected randomly in small, medium and large size categories [illegible]

Plant Archives Vol. 18 No. 2, 2018 pp. 2361-2362 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY OF THE INCOME FROM SORGHUM (JOWAR) UNDER DIFFERENT FARM SIZE GROUPS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

To judge the income level of the sorghum was the main objective of the present study which has been taken on the farmer's field during 2011-2012 in Ghazipur district of Uttar Pradesh at different from levels in comparison with local checks. It was formed the yield and net income was higher in demo. groups in Comparison to local checks, because all the advance package of practices has been applied properly and timely while local checks are only based on traditional practices, by virtue of lacking the knowledge local checks are suffered. The study has fi rely been concluded that there should be a wide range in future so increase their productivity and income by applying more and more advance technologies of cultivating the crop.

Key words: Farmers, yield, increasing trends, size groups.

Introduction

Sorghum, popularly known as Jowar. It grain is primarily as human food in various farms, such as Roti or is cooked like rice. Sorghums are also malted, popped and several local preparations are made. Green and dried fodder is the most important roughage for feeding cattle throughout the country. The utilization of grain sorghum as a cattle not very significant, although considerable scope exists. *Rabi* sorghums are wholly confined to black cotton soils, the *Kharif* Sorghums are grown on light soils also on a limited scale. Medium and deep black soils are predominantly suitable for this crop.

Sorghums are grown during in *Kharif* last week of June to July. The differed spread of high yielding varieties tends to enhance the attack of shoot fly on in this verities and the increased midge incidence on the locals, particularly during the *Kharif* Season. Wheat crop yield formed significantly higher after *Kharif* Sorghum, cowpea grain etc. Yield of wheat will be go down only after sorghum by using not a proper dose of organic fertilizer and cost of other sources of factors of production on higher side Sinsinwar (1994). Cultivatins of cereal forages along with legumes makes an increased quantity and nutritson's fodder resulted a greater improvement in soil quality. Green forage and dry matter yields formed significantly higher where maize and cow pea has been taken in consequent lines. The increase in the yield of green and dry matters in the intercropping system might be owing to the nutrient sparing effect of leguminous fodder, Tripathy *et al.* (1997). Nutrients requirement of the crop increasing day by day due intensive cropping system etc.

Materials and Methods

The present study has been taken on the field through farmers-scientist collaborations during the year 2011-12 in randomly selected village Nasirpur, Block Devkali of Ghazipur District of Uttar Pradesh Two farmers from each-groups ranging small, medium and large sizes has been randomly selected. The sorghum (Jowar) has been taken on the farmers field during last week of June to first week of July. Suggested the variety C.S.B.-15, Seed rate 15 Kg./ha. along with for better yield NPK application was put into the soil @ 40:20:20 Kg. per hectare. All the recommended package of practices has been applied to the crop during at the time of their needs for better yield and income. A comparative study has also been made through local check from same groups

Plant Archives Vol 17 No. 2, 2017 pp. 1061-1062 ISSN 0972-5210

STUDY THE PRODUCTIVITY AND BENEFIT COST RATIO OF ARHAR (REDGRAM) IN VARIOUS FARM SIZE GROUPS

Ajit Verma[1], S.P. Singh[2], Sarita Srivastava[3], Vinod Singh[4] and Avinash Kumar[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Director Extension, Narendra Deva University of Agril. & Tech., Kumarganj, Faizabad (U.P.), India.
[3]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.
[5]Ph.D. Narendra Deva University of Agril. & Tech., Kumarganj, Faizabad (U.P.), India.

Abstract

The main aim of the present study was to find out the productivity and benefit cost ratio of Arhar Variety Narendra Arhar-2 on randomly selected various farms size groups in randomly selected village Lahurapur of Bemo Block in Ghazipur district of Uttar Pradesh during 2011-12. It was found that yield and net return was increased in each size group, percentage of yield increases in comparison to local cheque also. The result of productivity clearly shows that the norms of advance package of practices not properly followed. It shows that result will all be better in future when the cultivation process of red gram has in a good farm planning manner along with the application of better fertilizer irrigation, interculture and insect pest management resulting better yield and more net returns.

Key Words : Crop, yield, groups, increasing trends

Introduction

The crop can be grown on almost all types of soils, ranging from alluvial soil, well drained light to medium soils, moist and deep enough to permit a free development of roots. The crop can be grown both in dry and moist hot climate. Bright sunny weather is needed during flowering, and the ripening of pods. The plants cannot with stand frost; the crop is sometimes irrigated late in December or early in January to protect it against frost. Extra-early and early types, maturing in 4-5 months, however, can be harvested before frost normally occurs. Good drainage is an essential requirement, as the crop cannot stand water lodging. Where subsurface drainage is poor, ridge planting is effective. In the case of mixed crops, the preparatory tillage for the major crop in the mixture is considered adequate for redgram. The mixed crop receives the interculture usual for the principal crops. The plants make slow growth until the cereal are other major crop is harvested. There after the plants of the Arhar [illegible] freely and flower profusely. Sowing of the crop [illegible] is better for growth and yield. Inter-row [illegible] space resulted maximum branches and pods. Sowing times and inter row spacing caused significant difference in branches, plant and pod, delayed sowings, giving lowest grain yield Ahuja, K.N. (1984). Late sowing affects seed germination due to higher existing soil moisture resulting decrease in pod numbers, grain yield goes down due to lower temperature with higher attack of pest at flowering times, quality of crop will be decreases Sukhadia, M.M. et al. (1990). The heavy shafting of leaves adds considerable organic matter to the soil. It is also often grown as a cover crop in plantations. The yield of redgram in intercropping system was generally reduced depending on nature of inter crops. Inter cropping cereals, pulses and oil seeds reduced the yield of red gram in many demonstrations might be seem to 30% to 40% respectively. In intercropping system groundnut proved to be most compatible inter crop with redgram probably because groundnut utilizers early-season resources efficiently Roysharma, R.P. et al. (1981). The maximum net return can be formed from intercropping of groundnut with redgram in upland areas.

Materials and Methods

[illegible]

Plant Archives Vol. 18 No. 2, 2018 pp. 2453-2454 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY OF THE PRODUCTIVITY AND ECONOMICS OF MUSTARD (*BRASSICA COMPESTRIS*) UNDER DIFFERENT FARM SIZE LEVELS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

The main motto behind this study was to judge the productivity and economics of mustard at different farm's level among the randomly selected farmers in Ghazipur district of Uttar Pradesh during the year 2011 – 2012. The productivity of net return was varies in demo. farmers in comparison to local check groups between small, medium and large size groups. It was only due to proper application of Sulphur, FYM and organic fertilizers timely. Irrigation and inter cultural operation management was better in demo groups. Crop was taken on the field in time was main key factor. The study concluded that in future organic and inorganic fertilizer management with weed management and proper irrigation facilities application productivity and income will be increase more and more.

Key words: Mustard, Yield, FYM, increase

Introduction

India, is one of the independence centers of origin of brown Sarson. Yellow Sarson is commonly grown in eastern parts of the country. Mustard yields the most important edible oil. The oil obtain is the main cooking medium in northern areas of the country. The seed and oil are used as condiment in the preparation of pickles and for flavouring curries and Vegetables. The oil cake is mostly used as a cattle feed where leaves of young plants are used as a green Vegetable. In our country it is grown in *Rabi* season. The seed from healthy and desirable plants, grown in isolation in the case of self-sterile form should be used. Whenever moisture in the field is inadequate, the seed is mixed with moist soil and kept overnight. For distributing evenly, the seed is usually mixed with sand before sowing. Whenever recommended doses of nitrogen along with farm yard manure put into the soil at the time of Rice and mustered cultivation resulted highest yield, if it application is goes down then the productivity will be affected. Therefore proper application of nitrogen and farm yard manure in Indian mustard cropping system for better productivity reported by Singh *et al.* (2001). Use of high yielding varieties is also an important factor, resulting for higher yield within optimum sowing time.

Materials and Methods

The present study was carried out on the field during 2011-12 in randomly selected village and block namely Belsari of Mardah Block, of Ghazipur district (U.P.) Six farmers has been selected from each farm size groups ranging small, medium and large on random basis with farmers scientist collaborations. Suggested variety Krishna, seed rate 5 Kg/ha., N.P.K. @ 120:40:40 Kg./ha. along with Sulphur 15 to 20 kg./ha. preferred 5 to 10 tones per hectare FYM for better yield and quality. The amount of Sulpher put into the soil not only for increasing the yield but oil yield also be increased with increasing level of Sulphur 10 to 15 Kg. per hectare more oil yield increased significantly by the use of Sulphur and proper irrigation needed Panda *et al.* (2000). Emphasis has been given more and more on thinning along with other inter cultural operations has been taken on the field time to time. Proper irrigation will be managed at the time of crop requirements. All information has been collected

Plant Archives Volume 20 No. 2, 2020 pp. 9368-9369 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY THE PRODUCTIVITY AND INCOME LEVEL OF POTATO UNDER VARIES FARM SIZE GROUPS

Ajit Verma[1], Anil Kumar Singh[2], Ashok Kumar Singh[3], Sarita Srivastava[4] and Vinay Kumar singh[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[5]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.

Abstract

The main aim of present study was to find out the productivity and income levels of Potato (Kufri Sindari) on randomly selected in different farm size groups in randomly selected village Govindpur and Kusmahi Khurd of Ghazipur district of U.P., India. It was found that yield and net income was increased in all size groups in both villages, but village Kusmahi Khurd farmers perform well. The result shows that all the package of practices was properly used. For the better yield and good quality of crop in future farmers of the both villages have aware about their application of all the Agro-Economical package of practices and crop management.

Key words: Yield, Income, Package of practices, Specific trends.

Introduction

Potato is one of the most valuable and cash crop in the world as well as in our country Indian. It is capable of producing more weight and calories for human beings in comparison to other crops. For this crop some time manual weeding is tedious which causes root injury resulting yield and qualities are affected under such circumstances chemical weeding is economical and preferable. Gran manuring, recycling crop residues and animal manures, and the inclusion of legumes in rotation, is important. Integrated nutrient supply is essential for production and qualities. Nitrogen plays an important role in improving the growth and its yield. Evidence is growing of favorable effect of phosphate solubilizing bacteria in providing plant nutrients to several crops and in supplements the expensive inorganic fertilizers. Sing and Sharma (1994) and Daka and Datta (1997) reported significant response of potato to Nitrogen level in acidic soils. Combine inoculation of Azotobacter and Phospho-inoculant culture is good for tuber yield and qualities. Use of Azotobactor and phospho-inoculant indicates that the bio-fertilizer increased the efficiency of applied nitrogen. Use of organic sources of nutrients, good quality of compost is better for tuber yield with better qualities Potato tubers are planted either whole or cut into pieces. This crop needs irrigation of frequent intervals depend upon the soil and climatic conditions. Usually, six irrigation are sufficient.

Materials and Methods

The present study was conducted in the selected randomly Village Govindpur of (Block-Mardah) and Kusmahi Khurd (Block-Devakali) in Ghazipur district of Uttar Pradesh, India through collaborations of farmers-scientist on the basis of small, medium and large size of farms. Randomly selected seven farmers from each groups Kufri-Sinduri Variety of potato suggested for the above demonstrated groups. For better yield suggested 25 tons of FYM along with 120:80:100 Kg/hect of NPK. The crop has been taken on the field during second fort night of November on ridges. All advance packages of practices has been specify for timed application or whenever it needed. Survey method has been used to collect the data and tabular analysis was being made, family schedule has been used to collect the data from the selected farmers according to their size of holdings family size, area of the production and income of the

International Journal of Professional Development
Vol.8,No.1,Jan-June 2019 ISSN: 2277-517X (Print), 2279-0659 (Online)
Impact Factor: 2.118(IFSIJ)

SIMULATION MODELLING OF SOLAR DRYING SYSTEM

Arun Kumar
Scientist, CCS Haryana Agricultural University, Hisar
Y.K. Yadav
Scientist, CCS Haryana Agricultural University, Hisar
Mukesh Kumar
Scientist, CCS Haryana Agricultural University, Hisar
Kapil
Corresponding author and freelance Agricultural Engineer
Email:singlekapil1981@rediffmail.com
Pramod Kumar Mishra[1]
Assistant Professor, MCAE&T, NDUAT, UP

Abstract
The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry at various operating conditions. Commercialization of any drying technology for agro processing or industrial use needs thorough performance prediction and evaluation of system in techno-economic perspectives.
Estimation of solar radiation at Hisar with the help of ASHRAE model has been in close agreement with the observed values taking 5% as level of significance. Thus the model can safely be used to predict isolation at Hisar. The calculated efficiency of the flat plate solar collector using the data at different point in the solar dryer during testing has been consistent.

Introduction

Drying is one of the essential unit operation performed to increase the shelf life of agricultural / horticultural produce and it is one of the most practical methods of preserving food and the quality of horticultural produce. Use of proper drying techniques can significantly reduce the post-harvest losses of fruits and vegetables (Arikan and Alam, 2018). There exist many technical problems associated with open sun drying namely cloudiness and rain, insect infestation, high level of dirt and atmospheric pollution and intrusions from animals and men. In addition to this there is no control on the drying process (VijayaVenkata Raman et al., 2012). Hence, developing countries, receiving significant amount of solar radiation must realise the importance of controlled drying using solar energy. Traditional method for fruits and vegetables drying in rural areas in India is to spread the products on the ground with exposure to the sun in the open air. Sun-drying method may be efficient and cheap process but has disadvantages such as contamination by dirt, insects and bacteria and loss due to wetting by rain squirrels (Esper and Muhlbauer, 1998). These are usually accepted as an inherent part of the method of processing. In order to protect the products from above mentioned disadvantages and also to accelerate the time for drying the products, control the final moisture and reduce wastage through bacterial action. Solar energy is fast becoming an alternative source of energy because of the high rate of depletion of the conventional energy sources. It has many advantages over other alternative source of energy such as wind because of its abundant, inexhaustible, renewable and non-polluting nature. Equally, it can be tapped at a relatively low cost. The associated danger of fire or other hazards are less (Ekechukwu and Norton, 1999).

Whereas, controlled solar drying system leads to faster rate of drying and exposure of products against rain, dust, storm, birds, rodents, insects and pests are avoided. This ensures better quality of dried products which would fetch higher prices (Hossain and Bala, 2007). In solar drying method, faster drying takes place which result a significant reduction in drying time. Product dried in solar dryer are superior in quality (colour and flavour). Though the same superior quality product can be obtained by using electricity or electric power, but the electric operations are expensive and are not within the reach of our rural and tribal population. There is also inadequate supply of electricity in rural areas. In such conditions solar-energy crop dryers appear increasingly to be attractive as commercial propositions (Das and Kumar, 1989).

The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry

Article AR2223 DOI: HTTPS://DOI.ORG/10.23910/1.2021.2223

International Journal of Bio-resource and Stress Management

June 2021

Print ISSN 0976-3868
Online ISSN 0976-4038

IJBSM 2021, 12(3):216-221

Research Article Natural Resource Management

Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors

A. D. Gupta*, Ashish Gupta, P. K. Mishra, Yashi Gupta and R. K. Mehta

Dept. of Mechanical Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh (224 229), India

Open Access

Corresponding Author

A. D. Gupta

e-mail: ct40964p@gmail.com

Citation: Gupta et al., 2021. Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors. International Journal of Bio-resource and Stress Management 2021, 12(3), 216-221. HTTPS://DOI.ORG/10.23910/1.2021.2223.

Copyright: © 2021 Gupta et al. This is an open access article that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

Conflict of interests: The authors have declared that no conflict of interest exists.

Abstract

This research investigation was undertaken in ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India to study the numerical optimization of natural convection heat suppression in a solar flat plate collector with straight fins. Optimal characteristics of an array of thin fins attached on the absorber plat were obtained by Particle Swarm Optimization algorithm (PSOA). Free convection considered dominant in the cavity. Governing equations contained continuity; momentum and energy are discretized by finite volume method. The medium is considered incompressible, whose free convection is dominant and Boussinesq approximation is applied. A simplified model of real systems is applied with free convection. Free convection problem is solved by SIMPLER algorithm. Two confined cavities with aspect ratios 30 and 60 are considered as flat plate solar collectors. The results indicate that significant reduction on the free convection heat loss can be obtained from solar flat plate collector by using plate fins, and an optimal plate fins configuration exit for minimal natural convection heat loss for a given range of Rayleigh number. Reduction of up to a maximum of 25% at 0 inclination angle was observed in aspect ratio 30. Results showed PSOA is able to obtain characteristics of attached adiabatic fins on the absorber plate also it can obtain optimal inclination angle of cavity to decrease heat losses from solar collectors. The results obtained provide a novel approach for improving design of flat plate solar collectors for optimal performance.

Keywords: Particle swarm optimization algorithm, solar collectors, natural convection

1. Introduction

Flat plate solar collectors are technique to utilizing solar energy. The flat plate absorbs incoming solar radiation and converts it in to heat and also transfers this heat to a fluid flow. Glazing cover plate prevents from heat loss by force convection but when temperature difference between flat plate and glazing cover plate exceeds to a critical value, natural convection will exist between absorber and cover plate. In present work of heat loss from absorber plate is reduced by investigating optimal characteristics of an array of thin fins are considered. Grossman et al. (1977) expanded a model for heat transfer in a flat plate solar collector with a rectangular channel for water or air fluid flow. The analysis was performed for temperature and heat flow distributions in both dimensions of the collector to investigate the thermal boundary layer development. Overall efficiencies are calculated for uniform solar

Article History
RECEIVED on 29th March 2021 RECEIVED in revised form on 29th May 2021 ACCEPTED in final form on 22nd June 2021

Efficacy of the prototype electrostatic nozzle for cotton crops

B. Patel[1], M. Singh[2], P.K. Mishra[3*], G.S. Manes[3] & M.K. Patel[4]

[1]*Department of Farm Machinery and Power Engineering, Chaudhary Charan Singh Haryana Agricultural University, Hisar, India*
[2]*Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India*
[3]*Department of Farm Machinery and Power Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, India*
[4]*Council of Scientific and Industrial Research, Central Scientific Instruments Organisation, Chandigarh, India*

A prototype of an electrostatic nozzle was developed for spraying cotton crops in a project titled 'Design and development of an electrostatic nozzle for agricultural applications'. The study was carried out to evaluate the locally-developed electrostatic nozzle and compare its performance with an imported electrostatic nozzle and solid cone nozzle (conventional knapsack sprayer) in the cotton crop at the departmental research farm of Punjab Agricultural University, Ludhiana, India. Different spray performance parameters, *i.e.* number median diameter (NMD), volume median diameter (VMD), uniformity coefficient, droplet density, the volume of spray deposition, and area covered with droplets were determined with the help of water-sensitive paper (WSP) method of deposition collection. There was comparatively less variation in uniformity coefficient with the imported and locally-developed electrostatic nozzles than the solid cone nozzle at a 5 % level of significance. The average droplet density obtained with both the imported and locally-developed electrostatic nozzles was significantly more compared to the solid cone nozzle. The area covered by the droplets of the locally-developed prototype of the electrostatic nozzle was more than the solid cone nozzle. The volume of spray deposition differed significantly for all three treatments at a 5 % level of significance. Overall, there was no significant difference in the performance of both electrostatic sprayers, but they were found to be more effective than the solid cone nozzle.

Key words: electrostatic nozzle, uniformity coefficient, droplet density, volume of spray deposition.

INTRODUCTION

Cotton is one of the most important textile fibres in the world, accounting for about 35 % of the total worldwide fibre usage. It is the single most cash crop that is cultivated extensively throughout the world. India, China and the United States of America are the major cotton-producing countries and together account for approximately two-thirds of total world cotton production (Anon 2015a). India is the largest cotton-producing country in terms of total production with an average of 6.10 Mt per year on a total sown area of 11.8 Mha. However, it has the 33rd ranking in the world in terms of yield per hectare because of a low average yield of about 517 kg/ha as compared to the world's average of about 566.27 kg/ha (Anon. 2015b).

Although cotton production and yield increased by introducing new crop varieties and production practices, still significant yield loss was observed as 4.1, 6.5, and 8.8 % in the cotton crop in three districts of India, namely Firozpur, Mansa, and Bathinda, respectively (Dhawan *et al.* 2008). Crop loss due to different insects has been reported to run to 18.0 to 50.0 % (Dhaliwal *et al.* 2010). In an another study the range of yield loss due to cotton leaf curl virus disease was reported to be from 81.4 to 88.4 % in all northern cotton-growing states of India (Monga 2014, as cited in Kumar Sain *et al.* 2019)

There are several spraying methods to protect crops from pests and diseases. Based on the volume application rate, there are three types of sprayers: high volume sprayer, low volume sprayer, and ultra-low volume sprayer. The high volume sprayer leads to loss of spray due to the larger size of droplets and more liquid application

*Author for correspondence. E-mail: pramod.bhg@gmail.com

Received 5 November 2020. Accepted 30 August 2021

ISSN 1021-3589 [Print]; 2224-8854 [Online]
DOI: https://doi.org/10.4001/003.029.0471

African Entomology 29(2): 471–478 (2021)
©Entomological Society of Southern Africa

RESEARCH PAPER | International Journal of Agricultural Engineering | Volume 12 | Issue 2 | October, 2019 | 199-202
ISSN-0974-2662 ■ Visit us : www.researchjournal.co.in ■ DOI: 10.15740/HAS/IJAE/12.2/199-202

Performance evaluation of mahua stamen remover

■ S. K. Pandey, V. Choubey, P. K. Mishra and S. Pandey

Received : 25.07.2019; Revised : 19.08.2019; Accepted : 05.09.2019

See end of the Paper for authors' affiliation

Correspondence to :
S. K. Pandey
Department of Agricultural Engineering, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) India
Email : sushil.pandey999@gmail.com

■ **ABSTRACT :** Mahua stamen remover was evaluated for its performance. It was tested at four moisture levels (11.9, 13.17, 15.64 and 17.66 % d.b.) and three feed rates (15, 21, 27 kg/h). The stamen removal efficiency and whole flower recovery were determined to optimize feed rate and moisture content of mahua flower for better performance of the machine.The present study revealed that the optimum flower moisture content and feed rate were found to be 13.17 per cent and 15 kg/h, respectively with stamen removal efficiency of 88.23 per cent and whole flower recovery of 81.2 per cent.

■ **KEY WORDS :** Mahua stamen remover, Stamen removing efficiency, Whole flower recovery ans desceder

■ **HOW TO CITE THIS PAPER :** Pandey, S.K., Choubey, V., Mishra, P.K. and Pandey, S. (2019). Performance evaluation of mahua stamen remover. *Internat. J. Agric. Engg.*, **12**(2) : 199-202, **DOI: 10.15740/HAS/IJAE/12.2/199-202.** Copyright@2019: Hind Agri-Horticultural Society.

Mahua *(Madhuca indica)* of Sapotaceae family is a large tree found inthe deciduous forest of India. Every part of the mahua tree is used by the tribals for their livelihood. Its flower is used as foods and can be fermented to alcoholic drinks due to its high sugar content. It is a multipurpose tree providing food, fuel, timber, green manure, oil, oil cake, liquor and raw materials for several products and is one of the most important trees of Indian forest. It also has a religious and a high bio-asthetic value in the tribal culture. It is one of those multipurpose forest tree species that provide an answer for the three major Fs *i.e.*, food, fodder and fuel (Banerji and Mitra, 1996). It is very important from the point of view that it can help inpromoting nutritional and economic security in backward areas.

The estimated annual production of mahua flower is around 2 lakh tonnes (*www. jhamfcofed.com*) in Jharkhand. Mahua tree produces edible flowers and fruits. The ripe flowers, which fall from the tree, are collected. The yield per tree ranges from 100-200 kg. Mahua is also famous for its seed oil.

Mahua flower can be utilized in a variety of ways in home, as animal feed and also as raw material for industrial products. They can be used as a sweetener inpreparation of many local dishes like *Halwa, Kheer, Puri* and *Burfi* (Patel and Naik, 2008). It is also used for preparation of bakery and confectionary goods. Tribal people also use it for brewing alcohol. It contains tannin as tannins are excellent antioxidant that helps in giving the structure, texture and flavour to wine. Mahua flowers are also considered good for cooling and are used as a tonic and demulcent. However, an estimated 90 per cent of the production goes into brewing beverages. Mahua has various types of medicinal uses due to its tannin content. It is used as anti-diabetic, antiulcer, hepato protective, anti-pyretic, anti-fertility, analgesic, anti-oxidant, swelling, inflammation, piles, emetic, dermatological, laxative, tonic, anti-burn, anti-earth worm, wound healing headache and many more problems (Patel *et al.*, 2012). On account of various advantages of mahua

Int.J.Curr.Microbiol.App.Sci (2020) *9*(10): 1379-1387

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 10 (2020)**
Journal homepage: http://www.ijcmas.com

Review Article https://doi.org/10.20546/ijcmas.2020.910.165

Advances in Sugarcane Peeling Mechanisation

S. K. Pandey[1*], P. K. Mishra[1] and S. K. Pandey[2]

[1]*Mahamaya college of Agricultural Engineering and Technology, Ambedkar Nagar-224122, (ANDUAT, Kumarganj, Ayodhya), India*
[2]*College of Agriculture, Kotwa, Azamgarh, 276001 (ANDUAT, Kumarganj, Ayodhya), India*

**Corresponding author*

Keywords

Sugarcane peeling machine, Peeling, Sugarcane, Mechanisation, Peeling efficiency

Article Info

Accepted:
12 September 2020
Available Online:
10 October 2020

A B S T R A C T

Sugarcane is multipurpose crop that serves as source of sugar, juices, jaggery and various products for man and raw materials for industry. But prior to the process of machining process, some processing is required to remove the solid particles, spots and sludge on the cane. The processing of sugarcane strip for industrial or human use involves different operations of which peeling is a major one and cannot be neglected. Of all the unit operations involved in cane processing, several processes have been mechanized successfully. This study presents the features, prospects, performance evaluations and limitations of some sugarcane peeling machines in world like the fixed outer drum peeler, automated cane peeler, knife-edge type self-fed peeler, etc. Their peculiar advantages and operational parameters such as machine speed, output capacity, peeling efficiency and cane losses were evaluated. Aside from the manual ones, the ranges of the peeling efficiency and cane loss were recoded in range of 59.9 – 91.4 % and 2–4% respectively. As machine speed increased, the output capacity and cane loss increased while peeling efficiency decreased. Mechanization of this peeling process has the potential of encouraging growth in cultivation, cane utilization and improving the product quality of value-added products. The product quality, processing efficiency, minimum loss of cane and increased processing rate will be affected by improved sugarcane peeling process.

Introduction

The sugar cane family is made up of over 30 sugar cane varieties. Sugar cane is a perennial grass that thrives in hot, humid locations like Brazil and India. The sugar derived from sugar cane is used in syrups, juices, and molasses, but the rest of the plant can also be used in the production of environmentally friendly paper products.

The juice from the sugar cane's stalk is highly prized and is the source of 70% of the world's sugar. It also has the highest number of calories per unit area of any plant. Fresh sugarcane juice is a popular beverage in many countries particularly in Asian region such as China, India, Malaysia and Thailand due to its taste and cheap price. Flavonoids that can be found in sugarcane juice have the abilities to protect cells from degenerative processes and to reduce the development of health problems

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ∷ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9415

A COMPARATIVE ANALYSIS OF PRESSURE AND SPEED ON VOLUMETRIC EFFICIENCY AND DISCHARGE OF THE RECIPROCATING PUMP

Dr. Rajat Kumar Mehta[1], Dr. Harish Chandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar Nagar, Uttar Pradesh, India[6]

Abstract: The experiment conducted at Mahamaya College of Agricultural Engineering & Technology, Ambedkar Nagar (U.P.). The pump tested for analysis performance is ELGIMACE model no. LLO3022 single acting reciprocating pump equipped with 2 HP three phase induction electric motor with 1440 rpm. A hose measuring of water source of 4.12x3.25x1.23. G.I.20 mm size, suction pipe was used. The delivery pipe was high density pliable reinforced rubber pipe to withstand abundant pressure (up to 25 kg/cm^2). Stop watch was measuring discharge of 1/100 sec. of leastcount. For three different speeds of 242 rpm, 285 rpm and 344 rpm with five dissimilar pressures are 1.5 kg/ cm^2, 5.7 kg/cm^2, 10.3 kg/cm^2, 15 kg/cm^2 and 24 kg/cm, pump was tested. Track record of all pipe pressure used for this testing was measured by a pressure gauge having adequacy 0-35 kg/cm. In motor shaft a V(twin) belt the electric connection was energized and a pulley with minimum diameter 6.25 cm was fitted. The outcomes based on the exploratory observation showed that the efficiency rises when pressure is rises. At speed of 344 rpm the efficiency is detected 90% and at dupe speed the volumetric efficiency is 77% for least pressure 1.5 kg/cm and volumetric efficiency is 95% for maximum pressure 24 kg/cm^2. The discharge increases as pressure goes up and it is showed by the average discharge and pressure, which is almost linear. The relationship sequence is mostly same for all above circumstances; this stated that discharge is mutual to the pressure for a reciprocating pump.

Index Terms: Discharge, Efficiency, Volumetric efficiency, Pressure, rpm, Static head, Reciprocal and Pressure head.

I. INTRODUCTION

Reciprocating pump is a pneumatic machine which gets converted in hydraulic energy from mechanical energy. A cylinder containing a reciprocating piston absorbs liquid which expend a thrust (impel) force on the liquid and hike its hydraulic energy (pressure energy of liquid). It's a kind of positive displacement pump which comprises of piston or plunger. It is used at a place where relatively small amount of water is to be delivered at high pressure. Water in cylinder is displaced by the movement of piston for the functioning of reciprocating pump. Valves control the flow. A piston or plunger is cylindrical piece which moves backward and forward inside hollow cylinder. Reciprocating pump's capacity depend on the sizes of cylinder chamber, piston length and piston stroke. Electric motor engine operate a pump which have to come into prominence in a large lift irrigation schemes, high output levels can be quickly attained and managed by this process. Reciprocating pump generates high head, but their capacity is smaller compared to other types of pump. Reciprocating pump works on single acting independent suction and discharge strokes works on double acting suction and they discharge in both the direction. Although, recommendation of specific purpose pumps is very tough due to the inaccurate figures about scientific information such as efficiency discharge, head relation and other characteristics. Understanding all this circumstances, under laboratory conditions a study was approached for evaluation of volumetric efficiency, pressure discharge relationship and speed-power-discharge.

©IARJSET This work is licensed under a Creative Commons Attribution 4.0 International License

Vol. 14(4), pp. 24-31, 15 March, 2019
DOI: 10.5897/SRE2016.6411
Article Number: BE06F8560496
ISSN 1992-2248
Copyright©2019
Author(s) retain the copyright of this article
http://www.academicjournals.org/SRE

ACADEMIC JOURNALS
Scientific Research and Essays

Full Length Research Paper

Precision attributes based index for the selection of efficient agricultural machinery

Manjeet Singh[1], Karun Sharma[2*], Pramod Mishra[1], Bharat Patel[1] and S K Singh[1]

[1]Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India.
[2]Krishi Vigyan Kendra, Samrala, Punjab Agricultural University, Ludhiana, India.

Received 5 May, 2016; Accepted 25 January, 2017

Development and introduction of high capacity, precise, reliable and energy efficient machinery/equipment is the need for judicious use of inputs. Manufacturing of agricultural machinery in India is varied in nature and starts from village artisans, tiny units, cottage to small scale industries, organized tractor and agricultural machinery manufacturers including energy and processing machinery industry. Precision in application rates for higher input-use efficiency can be achieved only by improving the designs of the existing machinery/equipment. Precision index (PI) of machine/equipment is based on its capability to perform a given task in an accurate manner. It is a worthwhile attribute to compare the performance of different equipment and operations to enhance the productivity of a given farm. The purpose of study was to propose an index, that is, PI to select efficient and precise machine/equipment for the farmers. PI values were calculated for three types of machinery namely zero seed cum fertilizer drills, planters and spraying machines. It was concluded that drill Make 2, tested in the year 2004, was having the highest PI value, that is, 0.87 or 87% followed by drill Make 1 having PI value 0.86 or 86% tested in the same year. Drill Make 6 tested in the year 2013 was having minimum PI value, that is, 0.80 or 80%. PI value for happy seeder machine was 0.88 or 88%. During the testing of multi-crop planter in year 2014, the variability of doubling attribute was more, that is, 28% followed by missing having 20% value and produced influence on PI which was observed to be 0.83 or 83%. PI of semi-automatic and automatic potato planter was found to be 0.70 and 0.80, respectively. The value was not much satisfactory and could be ranked under average category. PI of electrostatic sprayer mounted with single as well as twin nozzle was observed to be the highest, that is, 0.89 followed by PI of air assisted sprayer with single and double nozzle, that is, 0.83 and 0.84, respectively.

Key words: Precision index, zero till seed cum fertilizer drill, happy seeder, spraying machines, planting machines.

INTRODUCTION

Mechanization imparts capacity to the farmers to carry out farm operations, with ease and lesser drudgery. It helps the farmers to achieve timeliness, precisely meter and apply costly input with better efficacy and efficiency. Efficient machinery helps in increasing productivity by about 30% (Kulkarni, 2012) besides enabling the farmers

*Corresponding author. E-mail: karunluckysharma@gmail.com.

Author(s) agree that this article remain permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ∷ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9435

A REGRESSION ANALYSIS MODEL FOR ESTABLISHING CORRELATION BETWEEN RAINFALL AND GROUND WATERLEVEL FLUCTUATIONS WITH RESPECT TO APPLICATION ASPECTS

Dr. Rajat Kumar Mehta[1], Dr. Harish Chandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar Nagar, Uttar Pradesh, India[6]

Abstract: The study was made in order to establish correlation between rainfall and ground water fluctuation of Ambedkar Nagar District in Uttar Pradesh through regression analysis. To study the trend in ground water level in eastern U.P. Ambedkar Nagar a model was fitted known as regression model with data for every year from 2008-2017 .The developed model equation is $Y' = -3.59 \times 10^{-3}X + 13.7678810$ .The coefficient of correlation between water table and rainfall was observed as − 0.5735. The result of study had been evaluated through r^2, RMSE and EC were found to be -0.574, 1.23 & 96.6% respectively. The above empirical equation may be useful in prediction of water table depth from rainfall for base line for boring of tube well for timely irrigation of crop.

Index Terms: Rainfall, Regression Analysis, Correlation, Groundwater, Fluctuation.

I. INTRODUCTION

In 1959-60 the area underground water irrigation which is less than six million hectare but went up to 18 million hectare in 1980-81 to 33 million hectares in 1999-2000. More than half of the total irrigation is based on ground water, the share of ground water in area increasing from 30% in 1960-61 to 58.77% in 1999-2000. The area underground water is increasing progressively because it the most reliable and cost effective source of irrigation (Joshi, 2002).

The rainfall contributes to the annual increment in the ground water reserve which in turn is reflected in the rise of water table during the post monsoon period. Estimation of water table is needed for planning and developing the resources. With increasing demand for water for both agricultural and industrial use, the need to develop ground water resources to maximun possible extent has gained importance. The main component of recharge of ground water is precipitation. The ground level is an indicator of ground water availability. Ground water is an important resource of irrigation of India. It contributes to enhance agricultural production was better realize during green revolution and miss management has result in several problem likes fluctuation in water table and increasing in depth of well. In last 10 year out of total monitoring wells 60% showed depletion in water table depth during per monsoon dry session. This leads to associated problem off lowering tube well depth and drying of open dug wells in the areas. Few areas with associated problem of lowering tube well depth and drying of open dug wells has becomes the major issues. This also indicates the decreasing trend of ground water table depth over a period of time. The fluctuation of water table is mainly depending upon the precipitation received in the area. Being insufficient annual rainfall and which is not sufficient to crop production, it is become essential to have the use of ground water. For irrigation purpose the ground water is utilized through tube well, pumping etc. For installation of the tube well is necessary to know the base the depth of table.

The present investigation entitled to "develop the model for the prediction and relationship between rainfall and ground water fluctuation of Ambedkar Nagar District" was carried out with objective to establish correlation between rainfall and ground water fluctuation.

© IARJSET This work is licensed under a Creative Commons Attribution 4.0 International License

Plant Archives Vol. 19 No. 1, 2019 pp. 1358-1362 e-ISSN:2581-6063 (online), ISSN:0972-5210

ENERGY INPUT FOR FODDER CROP PRODUCTIONS UNDER DIFFERENT TYPES OF FARMING SYSTEMS

Pramod Kumar Mishra*, Sunny Sharma, Himanshu Tripathi and Dharmendra Pandey

Lovely Professional University, Phagwara, Punjab, India

Abstract

The pattern of energy utilize in cultivation of fodder crop was studied under traditional and partially mechanized farming system. It was observed that the total operational energy was found to be 6883.83 MJ/ha and 7298.73 MJ/ha in traditional and partially mechanized farming system respectively. Out of which 48.52 and 56.21 percent was utilized by direct source of energy in different farming systems, whereas 51.48 and 43.79 percent was utilized by indirect sources of energy. The total energy cost in traditional farming system was Rs 86450 /ha. Similarly, the cost of energy in partially mechanized system was Rs 93201 /ha. This difference clearly indicates that traditional farming system can be replaced by partially mechanized farming system with more return.

Key word: Partially mechanized farming system Energy ratio, energy productivity etc.

Introduction

Energy is integral part to national development process and to provide major vital services that improve human requirements; fuel for cooking, light for living, motive power for transport, and electricity for modern communication. In agricultural sector, its use is in every form of inputs, seed, fertilizer, agro-chemical for plant protection, machinery use for various operation, housing, transport, and processing. Apart from solar energy, production agriculture uses basic additional energy inputs, soil, water, tractive power, chemicals for growth of plants. The amount of energy invested through these inputs and quantity actually used by the plant govern the crop growth and yield during their life cycle.

Singh *et al.* 202 has estimated that total energy input Indian agriculture increased by 3.6 times. In modern agriculture, commercial energy sources (fuel, machinery and chemicals) contribute bulk of the energy supplies to the production system. Commercial energy use in agriculture has been increasing since revolution with increasing use of diesel and electricity in farm operations. The share of agriculture in electricity consumption has increased from 3.9% of the total consumption in 1950-51 to 29.6% in 1993-94. Total commercial energy use in agriculture increased nearly fivefold with growth rate of 11.8% between 1980-81 to 1994-95. The share of agriculture in total consumption in the country increasing marginally from 3.2 to 5.2% during the same period. Increase in land productivity and efficient diversification of agriculture for better economic return to the producers will call for significantly higher level of input to agriculture (Mahapatra, 1991).

India is presently under heavy stress on account of a large-scale exploitation for fuel wood, timber and fodder, mismanagement of forest resources and frequent fires. There is acute shortage of fodder especially green nutritious fodder, which is major cause of low productivity of livestock, especially in hilly area (Deb Roy *et al.*, 1989). The main reasons for low productivity is insufficient and low quality fodder and feed including grazing facilities (Deb Roy, 1993). Therefore, India has been the home of major draught, milch and dual-purpose breeds of cattle. Indian dairy production system is complex and generally based on traditional and socioeconomic considerations. However, there has been a rapid change in way of agriculture (*i.e.* cropping system, water resources, diversification of crops, intensification of agriculture), increasing use of mechanical power, transformation from

*Author for correspondence :

The Pharma Innovation Journal 2021; SP-10(8): 584-586

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 584-586
© 2021 TPI
www.thepharmajournal.com
Received: 12-06-2021
Accepted: 24-07-2021

Dr. Alpana Singh
Assistant Professor, Home Science, Deenanath Pandey Govt. Women P.G. College, Deoria, Uttar Pradesh, India

Sarita Srivastav
Assistant Professor, Community Science ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Dr. Alpana Singh
Assistant Professor, Home Science, Deenanath Pandey Govt. Women P.G. College, Deoria, Uttar Pradesh, India

Impact of mass media on academic achievement of school going adolescent in Varanasi city

Dr. Alpana Singh and Sarita Srivastav

Abstract
Mass media is a type of communication means, which is used to reach large numbers of population via newspaper, radio, magazine and television. Academic achievement is a simple word that denotes status of achieving educational goals by students, decided by teacher through formal or informal tests. This study done with the objective, to find out the impact of mass media exposure and contribution of mass media on academic achievement of selected group. 200 boys and 200 girls of 15-19 years of age group from 8 schools of Varanasi city were selected for the study. Study reveals that there is significant impact of mass media exposure on academic achievement and significant contribution of mass media on achievement was found on male and female intermediate students of Varanasi city.

Keywords: mass media, academic achievement, school going adolescent

Introduction
The term mass denotes great volume, range or extent of people or production, while communication refers to the giving and taking of message, the transmission and reception of message. The term mass media refers to the organized means for communicating openly and at a distance to many receivers within a short space of time. Mass media transfer knowledge more effectively to large number of receivers at multiple points irrespective of the distance between source and the receiver.

Mass media has prominent importance for developing country like India, such countries face number of problems. They have to find out their solutions and communicate it to the people, about four to five decades ago this was not possible, but with advent of mass media as an effective means of propagation and communication it has been achieved. Mass media have created a media audience which is now more conscious about learning and knowing.

The academic achievement is the end product of the instructions. It is a desirable learning that is observed in the learner. Any behavior that learned is achievement. It is learned amount of knowledge, understanding and acquisition of skills. Academic achievement is the task oriented behavior that allows the individuals performances to be evaluated according to some internally or externally imposed criterion that involved the individual in competing with others or that otherwise involves some standard of excellence. Academic achievement is level of attainment or performance in academic work measured by standard test or teachers or both. Good (1973) has defined academic achievement as the knowledge attained or skills developed in the school subjects, usually designated by test scores or by marks assigned by teachers or by both.

In school situation academic achievement generally means the quality and quantity of master the curriculum by students. In present study academic achievement was conceived in terms of percentage of marks obtained by the students in their previous class examination and teachers rating about the students.

Objectives of the study
Without good objective researcher cannot achieve their goal. The present investigation was designed with specific objectives:

1. To find out impact of mass-media exposure on male and female intermediate students on academic achievement.
2. To find out contribution of mass media exposure on academic achievement of male and female intermediate students.

Review Article

Animal Reproduction Update

Year 2022, Volume-2, Issue-2 (July-December)

ACS Publisher

Addressing Stray Animal Population Through Alteration of Sex Ratio

M. K. Shukla[1] and Rajesh Kumar[2*]

[1]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture and Technology, Modipuram, Meerut-250110 (UP)
[2]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary and Animal Sciences, ANDUAT, Kumarganj, Ayodhya (UP)

ARTICLE INFO

Key Words: Flow cytometry, Sexed semen, Swim up, Percoll density gradient

doi: 10.48165/aru.2022.2.2.2

ABSTRACT

Livestock plays a significant role in rural economy and livelihood by providing milk, meat, skin, drought power, etc. India's livestock sector is one of the largest in the world with a holding of 11.6% of the world's livestock population. But due to economic reasons, dairy farmers have a strong preference for female calves for milk production and hence there is a very limited demand for male calves. Furthermore, excessive focus on crossbreeding in the past few decades, increased mechanisation and the national policy to ban on cow slaughter have further added to the problem. In the common parlance, stray cattle include low-yield cows, bulls or calves that are abandoned and free to roam during dawn to dark because they are unproductive and creating a traffic nuisance in cities, they also attack crops in villages. Therefore, techniques for gender selection and skewing of sex ratio towards female are demanded of the hour. Flow cytometric sorting of spermatozoa is one of the best approaches to select the sexed semen for desire sex of calf, but its cost and patented technology is a definite disadvantage of this technology. In the present review, we will discuss in detail about the techniques available for skewing of sex ratio to address the stay animal population.

Introduction

India houses largest livestock population in the world (535.78 million) as per the 20th livestock census with a recorded increase of 4.6% over the previous livestock census of 2012. The total cattle inventory in the country is 305.5 million, which is the largest in the world followed by Brazil and China. Due to economic reasons, dairy farmers have a strong preference for female calves for milk production and hence there is a very limited demand for male calves. Rearing of male calf is an economic burden on dairy farmers. Hence a large number of male calves and unproductive animals are abandoned and are left as stray animals. India has over five million stray cattle, as per the 20th Livestock Census, which is a matter of concern for the country's livestock economy. All the major states with large livestock population, including Uttar Pradesh (17.34%), Madhya Pradesh (95.01%) and Punjab (38.69%)

*Corresponding author.
E-mail address: drrajesh25@gmail.com (Rajesh Kumar)
Received 06.06.2022; Accepted 06.07.2022
Copyright @ Animal Reproduction Update (acspublisher.com/journals/aru)

RESEARCH ARTICLE

Influence of Fortifying Graded Levels of *Moringa oleifera* Leaf Powder on Growth Performance and Haemato-biochemical Indices of Broiler Chickens

Ajeet K. Verma[1]*, Partha S. Pramanik[1], Manoj K. Verma[2], Sachin Gautam[3], Rajesh Kumar[4], Saurabh[4]

Abstract

The study was conducted to evaluate the influence of *Moringa oleifera* leaf powder (MOLP) on the growth and haemato-biochemical indices of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were: basal diet with no supplement (NC- negative control) and a basal diet supplemented with antibiotics (PC-positive control), 1% MOLP (MOLP1), 1.5% MOLP (MOLP1.5), and 2% MOLP (MOLP2). Bodyweight gain (BWG), feed intake (FI), feed conversion ratio (FCR), haemato-biochemical parameters, and economics were assessed in 35 days of the experiment. The results showed that BWG of birds was significantly ($p < 0.05$) higher in all Moringa supplement groups than NC group, but similar to PC group birds. Feed intake and FCR of Moringa supplemented and PC groups were significantly ($p < 0.05$) lower than the NC group, except MOLP2, which showed no difference in FI compared with the NC group. MOLP1.5 group birds recorded the best value of FCR among different groups. The highest profit per broiler was recorded in MOLP1.5 followed by MOLP1 and MOLP2 than NC, similar to the PC group. Hb and PCV values of the MOLP1.5 group were significantly ($p < 0.05$) higher than the NC group but comparable to the PC group. Platelet and WBC count were significantly ($p < 0.05$) lower in Moringa supplemented groups than NC and PC groups. A significant ($p < 0.05$) reduction was observed in blood glucose, SGPT, SGOT, cholesterol, and triglyceride levels of Moringa supplemented groups as compared to broilers of PC and NC groups. From the results, it was concluded that supplementation of 1.5% *Moringa oleifera* leaf powder improved the performance of birds without any detrimental effect on their health.

Keywords: Broilers, Growth performance, Haemato-biochemical profile, Leaf powder supplement, *Moringa oleifera*.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.3.7

Introduction

A very strong demand for animal protein for human beings has expanded, consolidated, and globalized in countries of all income levels. The poultry industry in India is one of the fastest-growing livestock sectors, with a growth rate of 8.51 and 7.52 % in egg and broiler production, respectively (BAHS, 2019). Antibiotic feed additives in food-producing animals have been used to meet the increasing demand for animal protein, including improved feed utilization, promotion in growth, and prevention from pathological micro-organisms. However, usage of antibiotic feed additives as growth promoters leads to harmfuleffects on consumer's health due to augmentation of microbial resistance and residual effect. Considering microbial resistance builds-up forces to reduce antibiotic feed additives in livestock and poultry production (Cheng *et al.*, 2019). Investigating safe and natural antibiotics alternatives is a tremendous challenge for animal scientists and veterinarians to meet the increased demand for providing wholesome meat at a low cost. Dietary inclusion of herbal plants and their extracts have been used as an alternative to antibiotic growth-promoter in poultry production (Movahhedkhah *et al.*, 2019).

[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[3]Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

Corresponding Author: Ajeet Kumar Verma, Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India, e-mail: ajeetverma95@gmail.com

How to cite this article: Verma, A.K., Pramanik, P.S., Verma, M.K., Gautam, S., Kumar, R., & Saurabh. (2021). Influence of Fortifying Graded Levels of *Moringa oleifera* Leaf Powder on Growth Performance and Haemato-biochemical Indices of Broiler Chickens. Ind J Vet Sci and Biotech, 17(3): 31-35.

Source of support: Nil

Conflict of interest: None.

Submitted: 21/01/2021 **Accepted:** 21/05/2021 **Published:** 16/08/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

VOL. VIII, ISSUE SPECIAL(C) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1] , P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2],Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]
[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly higher body weight, lower feed intake and better FCR(P<0.05). The body weight of chicks raised under sand and rice hull liter did not differ significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand litter. The performance index of the earlier study period was significantly higher in paddy straw+ rice hulls followed by sand and rice hulls respectively.

Key words: *Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001) .Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al*., 2007).Various types of litter materials like sand (shields *et al*., 2005), gypsum (Grimes *et al*., 2007), rice and wheat straw (Snehari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al*., 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse usability and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 80% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kala S. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at +2 days of age in wheat straw followed by sandy soil, saw dust, river Bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth performance of kadaknath fowls

To study the feed conversion efficiency of kadaknath fowls under various bedding materials

Materials and Methods:

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26° 47 North and longitude of 82° 12' East and it falls in Eastern Main Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. During this period, the climatic parameters have been shown in table 3.1. The average minimum temperature recorded during study period was 12.54°C, while the average maximum temperature was 24.86°C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 cm during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 Kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35°C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1238-1243

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1238-1243
Journal homepage: http://www.ijcmas.com

Original Research Article

Comparative Assessment of Fertility and Hatchability of Kadaknath and Aseel Fowls

Ajeet Kumar Verma[1]*, P.S. Pramanik[2], K.D. Singh[1], Gaurav Panday[2], H.C. Verma[3] and Rajesh Kumar Verma[4]

[1]Department of Livestock Farm Complex, [2]Department of Livestock Production Management, [3]Department of veterinary Extension Education, [4]Department of T.V.C.C , College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U.P.) 224229, India
*Corresponding author

Keywords

Eggs, Fertility, Hatchability, Kadaknath and Aseel

ABSTRACT

The present study was conducted to compare the fertility and hatchability of Kadaknath and Aseel fowls. For this purpose 50 birds from each breeds comprising of 45 females and 5 males were selected and kept in two different pens at poultry unit of Teaching Livestock and Poultry Farm of the College of Veterinary Science and Animal Husbandry, N.D.U.A.T. Kumarganj Faizabad (U.P.). Fertility was found higher in Kadaknath (86.18) than Aseel (81) with significant difference among them. Both hatchability on set egg and hatchability on fertile eggs were significantly differed among two breeds being higher in Kadanath. Average chick weight was found higher in Aseel than Kadaknath. Normal chick % was found highest in Kadaknath followed by Aseel. This result indicates that Kadanath are superior to Aseel in relation to fertility, hatchability and related traits.

Introduction

Indian poultry industry has made a tremendous and remarkable progress evolving from small scale backyard venture to the status of commercial, full-fledged, self sufficient and most progressive agro based industry. Poultry accounts for more than 30% of all animal protein consumption worldwide (Permin and Pedersen, 2000).Fertility and hatchability are the main factor which affects the profitability in the hatchery enterprise (Peters *et al.*, 2008).These parameters appears to be very important as for as parent stocks are kept to produce final hybrids. Hatchability is a major complex age dependent traits. Egg production and hatchability of broiler eggs can be influenced considerably by age of flock (Elibol *et al.*, 2002). Kadaknath (KN) is an important Indian reared poultry breed which is well known for poor egg production, slow growth rate, smaller body size as well as late sexual maturity. Aseel is noted for its Pugnacity, high stigma, and majestic gait and dogged fighting qualities.

The present experiment was designed –

1. To find the fertility, hatchability and associated traits in Kadaknath and Aseel.
2. To find out the correlation among hatchability traits in Kadaknath and Aseel.

EFFECT OF DIFFERENT LITTER MATERIALS ON BEHAVIOR OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2], M.K.Verma[1], K.D.Singh[3], Gaurav Panday[1], A.K.Srivastav[3] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

The present study was conducted to investigate theeffect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were seemed to be significantly differed in morning, noon and evening hour interval.

Key words: Kadaknath, feed, behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al*., 2007). Various types of litter materials like sand (shields *et al*., 2005), gypsum (Grimes *et al*., 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al*., 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more resale quality and very less caking.

Pine shavings and saw dust are the most desirabe and most widely used litter materials for broiler production in the United States. About 50% of farmers used saw dust as litter materials. 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, riverbed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26° 47 North and longitude of 82° 12 East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54°C, while the average maximum temperature was 24.86°C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 cm during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35°C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivrathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2020; 9(1): 533-535
Received: 10-11-2019
Accepted: 12-12-2019

HK Singh
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

CS Pandey
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Ashish Singh
Department of Horticulture, JS University, Shikohabad, Uttar Pradesh, India

Bhanu Pratap
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Anil Kumar
Department of Horticulture, SHUATS, Prayagraj, Uttar Pradesh, India

Corresponding Author:
HK Singh
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Effect of various storage media and storage period on bare root transplanting of aonla (*Emblica officinalis* Gaertn.) budlings

HK Singh, CS Pandey, Ashish Singh, Bhanu Pratap and Anil Kumar

Abstract
The experiment was carried out at experimental orchard of Department of Horticulture, NDUAT, Ayodhya (U.P). Based on the finding from present experimentation it was concluded that aonla bare rooted budling can be transported to distant places with good success. Among the storage media moist gunny bag and sphagnum moss followed by polythene sheet + sphagnum moss proveel equally effective for a period of more than 48 hours in keeping bare rooted budlings fresh for transplanting success.

Keywords: Budling, gunny bag, moss grass, polythene sheet

Introduction
Aonla or Indian gooseberry is an important fruit Indigenous to India. It can be successfully cultivated in marginal soils and various kinds of wastland. The poor establishment of budlings after transplanting is a major problem. On other hand transplanting budlings with earth ball cost heavy loss of fertile nursery soil and increases cost of transport budlings to distance places (Pareek and Vashishthag), bare rooted transplanting with growth regulators (Singh *et al*., 1982; Singh and Pandey, 2003) [6] and other treatment has been done with varying success (Sandhu *et al*., 1983a) [5]. Storage of budling often required because of labour problem, unfavorable weather condition, delay in field prepration transplanting loss and transplanting success owing to excessive loss from budlings. To overcome these problems transplanting of bare rooted aonla budling success need to find a suitable storage and period of storage.
Media for storage of budling for longer period for better transplanting success.

Materials and Methods
The experiment was carried out at experimental orchard of Department of Horticulture, NDUAT, Ayodhya (U.P). For the study single stem defoliated uniform in age and vigour budlings were selected for different storage medium and period of storage. There were four storage media, V12 moist, gunny bag, sphagnum moss, polythene sheet and polythene sheet + sphagnum moss, similarly four storage period V12, control (zero day) 48, 96 and 144 hours. Ten budlings were transplanted in field at each date at 30x30 cm apart, replicated thrice. The observations were recovered on transplanting success and plant growth of budling were recoverd after 150 day of transplanting. The data was analyzed as per method given by Panse and Sukhatme (1989) [4].

Results and Discussion
Storage medium and period played vital role in esbalishment of anola budling (Table -1). Bare rooted budlings stored in moist gunny bag showed highest success (75.0%) closdy followed by sphagnum moss (74.17%) and polythene sheet + sphagnum moss (71.67%). Budlings establishment decreased during storage but budlings establishment was not affected up to 48 hrs storage. Data presented in Table 2 indicated quicker sprouting (25.75 days) in polythene sheet + sphagnum moss stored budlings. Budlings stored in moist gunny bag (28.42 days) was statistically at par with sphagnum moss stored budlings. The time taken was significantly less in case of 48 hrs storage (24.50 days as compared with other storage period. It is evident from table 3 & 4 that budling hight and diameter were influed by various storage media and period of storage. The plant hight was highest (109.25 cm) in moist gunny bag an minimum in polythene sheet stored budlings to were, the values did not differed significantly in other store medium except, polythene sheet storage. Bundling diameter ranged between 1.13 cm in polythene sheet to 1.21 cm in moist gunny bag storage media and differed significantly. Budling diameter decresed with increase in storage period being (1.25 cm) in immediate

ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/340443588

Effect of various storage media and storage period on bare root transplanting of aonla (Emblica officinalis Gaertn.) budlings

Article · January 2020

CITATIONS
0

READS
47

7 authors, including:

H.K. Singh
Narendra Deva University of Agriculture and Technology
48 PUBLICATIONS **80** CITATIONS
SEE PROFILE

Ashish Singh
Sam Higginbottom University of Agriculture, Technology and Sciences
3 PUBLICATIONS **0** CITATIONS
SEE PROFILE

Anil Kumar
28 PUBLICATIONS **42** CITATIONS
SEE PROFILE

Bhanu Pratap
Narendra Deva University of Agriculture and Technology
27 PUBLICATIONS **19** CITATIONS
SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Variability, heritability and genetic advance studies in French marigold (Tagetes patula L.) View project

All content following this page was uploaded by Ashish Singh on 27 March 2022.

The user has requested enhancement of the downloaded file.

Indian Journal of Ecology (2022) 49(1): 280-287
DOI: https://doi.org/10.55362/IJE/2022/3518

Manuscript Number: 3518
NAAS Rating: 5.79

Bird Diversity in Riverscapes of Ayodhya District, Uttar Pradesh

Yashmita-Ulman

Department of Silviculture & Agroforestry, College of Horticulture & Forestry
ANDUAT, Kumarganj, Ayodhya-224 229, India
E-mail: yashmita2018@gmail.com

Abstract: The bird diversity using line transect method along the 45 km stretch of Saryu river between Aharauli and Pitapur in eastern Uttar Pradesh was assessed. A total of sixty eight bird species, belonging to 56 genera, 35 families and 12 orders were recorded from the study area. Passeriformes (24) had the maximum number of bird species. The maximum encounter rate was for Indian Silverbill (2.685) and the minimum for Blue-tailed Bee-eater (0.054). Out of 68 bird species recorded, 56 bird species (82%) were resident, 11 bird species (16%) were winter visitors and only 1 bird species (1%) was summer visitor. A large number of Carnivores (29 species, 43%) were recorded in the area. Of the recorded species, nine were in the threatened category of IUCN Red List and eighteen species (26%) of birds had a declining population trend globally highlighting the conservation value of riverscapes of Saryu river. This study has helped in generating a baseline information on the bird diversity of the Saryu river and emphasis on carrying out long-term monitoring of birds in such threatened ecosystem.

Keywords: Avian, Freshwater ecosystems, Feeding guild, Ayodhya, Saryu river

Freshwater is a natural resource which is important in terms of economy, culture, science and education (Dudgeon et al 2006). Freshwater habitats including rivers, streams, lakes, oxbows, wetlands and estuaries etc. and their adjacent areas called riparian zones alone support around 6% of world known species (Hawksworth and Kalin-Arroyo 1995). Birds are an important constituent of the riverscape. A riverscape is a landscape constituting of the streams, floodplains and riparian zones along a river channel (Wiens 2002). The riverscapes provide essential dispersal pathways, shelter, breeding and nesting sites for the birds, thus supporting high bird species diversity (Sinha et al 2019). But as these riverscapes are exposed to anthropogenic pressure due to its productivity and developmental activities, these areas are the most threatened ecosystems of the world (Revenga et al 2005). Thus, leading to loss of the ecosystem and their associated bird diversity. These riverscapes are meagerly managed from conservation point of view. In addition, the existing knowledge on bird diversity in these ecosystems is incomplete and insufficient to assess the impacts of anthropogenic pressures on bird diversity loss.

The river Ganga is one of the largest rivers with many tributaries flowing through 2510 km from north to east India (Adel 2001). This river supports 8% of the world's population living in its catchment (Newby 1998). Understanding the bird diversity, abundance and habitat preferences are necessary baseline parameters for planning conservation activities, but such information is meagre from certain tributaries of Ganga. Studies have been conducted on the faunal diversity of some segments along the stretch of Ganga (Behera 1995, Bashir et al 2012). Ghaghra river is one of the principal tributaries of river Ganga. The Ghaghra joins its sub-tributary, the Sharda river and flows through the district of Ayodhya where it is locally known as Saryu river (Dhar and Nandargi 2002, Singh et al 2016). There have been no bird diversity studies done on the Saryu river flowing through Ayodhya district, Uttar Pradesh. Therefore, in this study, an attempt was made to document the bird diversity in the catchment area of river Saryu.

MATERIAL AND METHODS

The study was conducted in a 45 km stretch of Saryu river flowing between Aharauli 26.858°N and 81.814°E and Pitapur 26.782°N and 82.256°E in Ayodhya district, Uttar Pradesh (Fig. 1). The banks of this river are sandy or muddy; the floodplains are mosaic of agriculture, orchards, forests, grasslands etc. The climate of the district is tropical monsoon. The average temperature varies from 32°C in summers to 16°C in winters and the average annual rainfall is 1067 mm (Anonymous 2021). There are three distinct seasons – summer (March to June), rainy (July to October) and winter (November to February). Hundreds of pilgrims visit the river banks of Saryu during Hindu festivals to perform religious ceremonies.

The entire 45 km stretch of the Saryu river in Ayodhya district was divided into nine segments of 5 km each. Bird survey was done using line transect method (Gregory et al 2004) in five segments (selected based on their accessibility and feasibility of sampling), so in all covering a stretch of 25 km. Five transects (5 km each) were laid parallel to the river

Indian Journal of Traditional Knowledge
Vol 21(2), April 2022, pp 414-424

Traditional agroforestry systems and practices of Assam

Yashmita-Ulman[a,*], Awadhesh Kumar[b] & Madhubala Sharma[b]

[a]Department of Silviculture & Agroforestry, College of Horticulture & Forestry, ANDUAT, Kumarganj 224 229, Ayodhya, Uttar Pradesh, India

[b]Department of Forestry, NERIST, Nirjuli 791 109, Itanagar, Arunachal Pradesh, India

E-mail: yashmita2018@gmail.com

Received 27 January 2020; revised 01 June 2021

Agroforestry is an age-old practice in Assam, the Northeastern state of India. But the documentation of such traditional practices is very meagre. Assam has six agro-ecological zones. This paper attempts to present the different types of traditional agroforestry systems practiced in North bank plains of agro-ecological zone of Assam. The documentation was done through direct observations. A questionnaire survey was done of 500 households in 250 villages distributed across four districts (Dhemaji, Lakhimpur, Sonitpur and Darrang) of Assam. Altogether 11 types of traditional agroforestry systems are recorded. Homegarden is the most common agroforestry system in all the four districts followed by aquaforestry and commercial crops trailed on support trees. The least common agroforestry system is *Machilus*-based agroforestry system and this system is not recorded from Darrang and Sonitpur districts of Assam. The choice of species and their planting pattern are influenced by their tradition, usage pattern and need of the agroforestry system's owner. These traditional agroforestry systems are a part of their traditional knowledge which is intervened with their traditions and culture. It is a blend of time-tested knowledge of indigenous species, their compatibility and species planting pattern such that the yield is maximized. So, the documentation of these environment-friendly traditional practices is essential to advocate climate-smart and sustainable approach in agriculture.

Keywords: Assam, Aquaforestry, *Areca*-based cropping, Live fence, *Machilus*-based agroforestry

IPC Code: Int. Cl.[22]: A01D 9/00, A01G 23/00

The traditional agroforestry is a human-managed land-use system in which woody perennials are intentionally grown in association with agricultural crops, pastures as well as livestock. Most of these traditional farming practices are rainfed and for household consumption purposes. The crops planted, the crop combination and the sequence of cropping in these traditional practices depend upon the edaphic, climatic, topographic conditions of the area and socio-economic status of the people. These practices are passed on from generation to generation but are not documented. In the recent years, these traditional ways of farming and cultivation are gaining importance as these practices are sustainable and environment-friendly. Therefore, emphasis is being given on documentation of these fast-depleting traditional methods of cultivation.

The traditional agroforestry systems and its practices have been documented in many countries such as Africa[1], China[2], Turkey[3] and Bangladesh[4]. In India, though agroforestry is being practiced from ancient times, only a few authors have documented these practices. A thorough literature review highlighted an inventory of the existing agroforestry systems in different states of India such as Kerala[5], Uttar Pradesh[6], Meghlaya[7], Arunachal Pradesh[8], Chattisgarh[9] and Nagaland[10]. Four agroforestry systems namely rainfed agrihorticultural system (*Cocos nucifera, Areca catechu, Citrus* sp., *Zingiber officinale, Curcuma longa*), silvipastoral systems (*Artocarpus* sp., Napier grass, Guinea grass), silvihortipastoral systems (*Bombax ceiba*, Thatch) and irrigated silviagrosystem (*Azadirachta indica, Oryza sativa* and oilseeds) are reported from Assam[11].

It is quite evident from the above that traditional agroforestry systems are present in Northeast India, and there is only a single case of inventory of the systems practiced in Assam. This shows that many agroforestry systems and practices still remain to be documented from this region. Therefore, there is a need to capture the local and traditional plant management practices before these are lost forever. Also, with the increasing

*Corresponding author

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 July 2020 | 12(10): 16230–16238
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
DOI: https://doi.org/10.11609/jott.5754.12.10.16230-16238
#5754 | Received 03 February 2020 | Final received 04 July 2020 | Finally accepted 10 July 2020
PLATINUM OPEN ACCESS

COMMUNICATION

Negative human-wildlife interactions in traditional agroforestry systems in Assam, India

Yashmita-Ulman [1], Manoj Singh [2], Awadhesh Kumar [3] & Madhubala Sharma [4]

[1] Department of Silviculture and Agroforestry, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh 224229, India.
[2] Department of Zoology, Kalinga University, Near Mantralaya, Naya Raipur, Chhattisgarh 492101, India.
[3,4] Department of Forestry, North Eastern Regional Institute of Science and Technology, Nirjuli, Arunachal Pradesh 790109, India.
[1] yashmita2018@gmail.com (corresponding author), [2] msingh.zooku@gmail.com,
[3] tpileatus@gmail.com, [4] mbs_madhu@yahoo.co.in

Abstract: Traditional agroforestry systems are designed to provide maximum and diverse yield (ranging from agricultural crops, forest trees, livestock and fish) to people. They also act as sources of food and shelter to wild animals leading to crop destruction, livestock depredation and injuries to people giving rise to negative human-wildlife interactions. The present study was carried out in three different agroforestry systems namely tea gardens, homegardens, and agrisilvicultural systems in Assam to document the attitude of people towards wild animals which damage the crops and livestock, through questionnaire surveys. In agroforestry systems, 13 animals were reported as destructive; rodents at 13% followed by Indian Hare at 12%. The least destructive were birds and bats with 4% each. In tea gardens majority of the people killed animals for meat (95%) and the most common method for killing was the use of catapults (77%). In homegardens and agrisilvicultural systems, owners chased the animals away (82%) by using catapults (68%). Hunting of animals and intolerance of people towards crop destruction and livestock depredation done by wild animals were the two main reasons causing negative human-wildlife interactions in agroforestry systems. The present study concludes that wildlife species found in the agroforestry system in Assam were threatened by local inhabitants and thus, a suitable conservation awareness and policy action plan should be developed in consultation with the owners of agroforestry systems by considering the ecological significance of the wildlife species found therein.

Keywords: Agrisilvicultural systems, agroforestry systems, crop destruction, destructive wildlife species, homegardens, tea gardens.

Editor: Mewa Singh, University of Mysore, Mysuru, India. **Date of publication:** 26 July 2020 (online & print)

Citation: Yashmita-Ulman, M. Singh, A. Kumar & M. Sharma (2020). Negative human-wildlife interactions in traditional agroforestry systems in Assam, India. *Journal of Threatened Taxa* 12(10): 16230–16238. https://doi.org/10.11609/jott.5754.12.10.16230-16238

Copyright: © Yashmita-Ulman et al. 2020. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: CSIR, New Delhi funded the project titled "Studies on Contribution of Agroforestry Systems in Wildlife and Biodiversity Conservation in Northeast India", Sanction No. 37(1585)/13/EMR-II.

Competing interests: The authors declare no competing interests.

Author details: DR. YASHMITA-ULMAN, works as Assistant Professor in Department of Silviculture & Agroforestry, ANDUAT, Ayodhya, on agroforestry systems. Her research interests include plant-animal interactions, forest ecology and wildlife conservation. DR. MANOJ SINGH works as Assistant Professor in Department of Zoology, Kalinga University, Chhattisgarh. He is working on bird acoustics and wildlife conservation using GIS. DR. AWADHESH KUMAR works as an Associate Professor in Department of Forestry, NERIST (Deemed-to-be-University), Nirjuli, Itanagar, Arunachal Pradesh. He works on population and beahvioural ecology of threatened mammalian species and other wildlife of northeast India. His interest lies in ecological process related to wildlife conservation and forest management under the umbrella of forestry research. PROFESSOR (MRS.) MADHUBALA SHARMA also works in the Department of Forestry, NERIST (Deemed-to-be-University), Arunachal Pradesh. She is specialized in the field of wood science & technology and non-timber forest products.

Author contribution: Y-U did the fieldwork and wrote the article. MS helped with the data compilation and analysis. AK and MS edited and finalized the manuscript.

Acknowledgements: We are extremely grateful to all the owners of the agroforestry systems, viz. home gardens, agrisilviculture and tea garden for permitting to carry out the present study as well as for sharing valuable information about presence of wildlife and human-wildlife interactions. Authors are thankful to Director and Head of Department, Forestry for their administrative support and to CSIR, New Delhi for providing financial support.

Acta Ecologica Sinica 42 (2022) 188–197

Contents lists available at ScienceDirect

Acta Ecologica Sinica

journal homepage: www.elsevier.com/locate/chnaes

Density, habitat associations and conservation status of *Gekko gecko* (Tokay gecko) in human-dominated landscapes around Nameri Tiger Reserve, Assam, India

Yashmita-Ulman [a], Manoj Singh [b,*]

[a] Department of Silviculture and Agroforestry, College of Horticulture & Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India
[b] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh, India

ARTICLE INFO

Article history:
Received 14 November 2020
Received in revised form 16 March 2021
Accepted 17 March 2021
Available online 5 April 2021

Keywords:
Homegardens
Habitat preferences
Tree preference
People's attitude
Distance from forest
Source of income
Gender

ABSTRACT

This study conducted from January to June 2018, attempts to determine the density, habitat preferences and attitudes of people towards *Gekko gecko* and its impact on the conservation of this species in human-dominated landscapes in Sonitpur district, Assam. Eight villages at different distances from Nameri Tiger Reserve were chosen for the study. The line transects analyzed using DISTANCE software estimated a density of 7.99 individuals ha^{-1} in fringe villages of Nameri Tiger Reserve which also had higher number of host tree species diversity with higher basal area and density as compared to that of villages distant from Nameri Tiger Reserve. *Gekko gecko* was sighted on a total of 30 trees (6 species, 2 families), the highest being *Ficus rumphii* (40%). Maximum sightings of *Gekko gecko* was done on trees (67%). The occurrence of *Gekko gecko* was highly influenced by distance from forest (12%), followed by source of income (11%) and gender (4%). The majority of the respondents (53.54%) revealed that *Gekko gecko* occurred naturally in the homegardens implying that homegardens provided the habitat that can support the populations of *Gekko gecko*. But 46.45% of the respondents reported that they were adopted (62.16% in villages distant from Nameri Tiger Reserve), which raises serious concerns about the conservation of *Gekko gecko* in homegardens. Though, majority of the people knew that it is illegal to trade *Gekko gecko*, the financial benefits of its trade is very alluring. To make homegardens more favourable for the survival of *Gekko gecko* there should be strict law enforcement, upgradation of the species in the IUCN Red List and options for alternative livelihood.

© 2021 Ecological Society of China. Published by Elsevier B.V. All rights reserved.

1. Introduction

Biodiversity conservation is a challenge for the conservationists, as the tropical forests are getting depleted, fragmented and isolated into human-modified landscapes [31,33]. Moreover, the protected areas set aside to protect the species and its habitat [5] are under constant human pressure [27]. Many studies have suggested that the natural habitats outside protected areas also have the ability to conserve species diversity [23]. So, the need of the hour is to conserve biodiversity in these rapidly increasing human-dominated landscapes which are outside the protected areas. But the anthropogenic pressure in these landscapes alters the ecosystems processes [45]. The existence of native fauna in such areas depends upon their ability to traverse through the modified habitats, patches and to adjust with the constant changes in their habitat [13]. Reptiles are conspicuous and abundant in nature making them good candidates for studies on understanding the impact of habitat change [20]. As reptiles are found in diverse habitats and niches, they are very sensitive to landscape level changes and deforestation [22,59]. They are also vulnerable to the micro-habitat level changes due to their ectothermic nature [42]. Yet studies have shown a high persistence of reptiles in altered habitats [54,60].

Northeastern India is known to harbor a good reptile diversity (121 species) with a high percentage of endemic and threatened species [44]. But as conversion of tropical forests into tea plantations, agricultural lands, human habitations etc. is very rapid in the northeastern states of India, it leads to fragmentation, deforestation [10–12] and thus habitat loss and decline in reptilian species [57]. The Sonitpur district of Assam alone has reported conversion of well stocked forests into human-dominated landscapes leading to an overall loss of 232.19 km^2 of forest between 1994 and 2001 [55]. The human-dominated systems like homegardens, agricultural lands, cacao and coffee plantations interspersed with secondary forest patches and remnant vegetation are known to harbor rich reptilian diversity comparable to the adjacent forests [50,60,61]. But in such human-dominated areas, the attitudes of the local communities plays an important role in the conservation of species as such areas are known for their negative interactions with faunal species [66,67]. Due to the dearth of information on the population density

* Corresponding author.
E-mail address: msingh.zooku@gmail.com (M. Singh).

https://doi.org/10.1016/j.chnaes.2021.03.004
1872-2032/© 2021 Ecological Society of China. Published by Elsevier B.V. All rights reserved.

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 July 2021 | 13(8): 19011–19028
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
https://doi.org/10.11609/jott.7089.13.8.19011-19028
#7089 | Received 15 January 2021 | Final received 14 May 2021 | Finally accepted17 June 2021

OPEN ACCESS

COMMUNICATION

Bird composition, diversity and foraging guilds in agricultural landscapes: a case study from eastern Uttar Pradesh, India

Yashmita-Ulman [1] & Manoj Singh [2]

[1] Department of Silviculture & Agroforestry, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh 224229, India.
[2] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh 492101, India.
[1] yashmita2018@gmail.com, [2] msingh.zooku@gmail.com (corresponding author)

Abstract: Birds have a significant role in maintaining the ecological balance of agro-ecosystems. But yet there is no documentation related to bird diversity in the agricultural landscapes of eastern Uttar Pradesh. This study was conducted from March 2019 to February 2020 using fixed radius point count method in Ayodhya district of eastern Uttar Pradesh. A total of 139 bird species belonging to 107 genera, 49 families and 15 orders were recorded from the study area. Passeriformes was the most dominant order with 28 families and 76 species. Accipitridae and Muscicapidae were the most diverse families with 11 species each and RDi value of 7.91. Among the recorded bird species, 105 species (76%) were resident, 29 species (21%) were winter visitors and only 5 species (4%) were summer visitors. According to the feeding guilds, omnivores (46 species, 33%) were highly represented, followed by insectivores (31%), carnivores (25%), granivores (6%), frugivores (4%) and nectarivores (1%). The Sohawal tehsil was found to have the highest species richness and a Shannon-Weiner diversity index (133, 4.30). *Aquila nipalensis* and *Neophron percnopterus* were the two 'Endangered' species, *Antigone antigone* and *Clanga hastata* were the two 'Vulnerable' species and *Ciconia episcopus, Gyps himalayensis, Mycteria leucocephala* and *Psittacula eupatria* were the four 'Near Threatened' species found in this region. In addition to this, the region also supported 31 species (22%) whose global population trend is decreasing. This study provides a baseline data on the bird diversity present in agricultural landscapes of this region. Based on which further studies should be designed to understand the factors influencing the diversity of birds in these agricultural landscapes which are continuously subjected to anthropogenic pressures.

Keywords: Ayodhya, Avifauna checklist, community parameters, feeding guilds, relative diversity, species richness.

Hindi: पारिस्थितिकी तंत्र के पारिस्थितिक संतुलन को बनाए रखने में पक्षियों की महत्वपूर्ण भूमिका होती है लेकिन अभी तक पूर्वी उत्तर प्रदेश के कृषि परिदृश्य में पक्षी विविधता से संबंधित कोई भी शोध उपलब्ध नहीं है। यह अध्ययन पूर्वी उत्तर प्रदेश के अयोध्या जिले में निश्चित त्रिज्या बिंदु गणना पद्धति का उपयोग करके मार्च 2019 से फरवरी 2020 तक आयोजित किया गया था। अध्ययन क्षेत्र से 107 वंशों 49 कुलों 15 गणों से संबंधित कुल 139 पक्षी प्रजातियों को दर्ज किया गया था। 28 कुलों और 76 प्रजातियों के साथ पैसेरीफार्मिस सबसे प्रमुख गण था, एक्सीपिट्रीडी और मस्सीकैपिडी सबसे अधिक विविधता वाले कुल थे जिनमें से प्रत्येक में 11 प्रजातियां थी और आरडीआई मान 7.91 था। दर्ज की गई पक्षी प्रजातियों में 105 प्रजातियां स्थानीय थी 21% प्रजातियां शीतकालीन आगंतुक थी और केवल 5 प्रजातियां विषम कालीन आगंतुक थी। फीडिंग गिल्ड के अनुसार 40 प्रजातियां सर्वाहारी थी इसके बाद 21% कीटभक्षी, 25% मांसाहारी, 6% दानाभक्षी, 4% फलभक्षी और 1% मकरंद आहारी थी। सोहावल तहसील में उच्चतम प्रजाति समृद्धि और शैनन विनर विविधता सूचकांक (133,4.30) पाया गया। एक्विला निपालेंसिस और नियोफ्रान पक्नोप्टेरस दो संकटग्रस्त प्रजातियां थी, एंटीगोन और क्लैंगा हस्तटा दो सुभेद्य (वल्नेरेबरल) प्रजातियां थी और सिकानिया एपिस्कोपस, जिप्स हिमालयेंसिस, माक्टेरिया ल्यूकोसेफला और सिटाकुला यूपेट्रिया चार संभावित संकटग्रस्त प्रजातियां थी जो इस क्षेत्र में पाई जाती है। इसके अलावा इस क्षेत्र में पाई जाने वाली प्रजातियों में से ३१ प्रजाति ऐसी भी थीं जिनकी वैश्विक जनसंख्या लगातार कम हो रही है। यह अध्ययन कृषि परिदृश्य में पक्षियों की विविधता को समझने के लिए भविष्य के अनुसंधानो के लिए एक महत्वपूर्ण साधन साबित हो सकता है, विशेषकर उन क्षेत्रों के लिए जो मानव जनित दबावों का सामना कर रहे हैं।

Editor: Hem S. Baral, Charles Sturt University, Albury, Australia. **Date of publication:** 26 July 2021 (online & print)

Citation: Yashmita-Ulman & M. Singh (2021). Bird composition, diversity and foraging guilds in agricultural landscapes: a case study from eastern Uttar Pradesh, India. *Journal of Threatened Taxa* 13(8): 19011–19028. https://doi.org/10.11609/jott.7089.13.8.19011-19028

Copyright: © Yashmita-Ulman & Singh 2021. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: Self-funded.

Competing interests: The authors declare no competing interests.

For **Author details** and **Author contributions** see end of this article

Acknowledgements: The authors are thankful to the Dean, College of Horticulture and Forestry, ANDUAT, for permitting to carry out this field research. Our special thanks to Mr. Abhishek Kumar Pandey for translating the abstract in Hindi.

Agric Res
https://doi.org/10.1007/s40003-020-00525-9

FULL-LENGTH RESEARCH ARTICLE

Conservation of Plant Diversity in Agroforestry Systems in a Biodiversity Hotspot Region of Northeast India

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 18 January 2020 / Accepted: 15 October 2020
© NAAS (National Academy of Agricultural Sciences) 2021

Abstract In Assam, a north-eastern state of India, most of the traditional agroforestry systems are still practised. The plant species composition of three agroforestry systems namely homegardens tea gardens and agrisilvicultural systems, were assessed using quadrat method. A total of 516 plant species belonging to 241 genera under 91 families were recorded, which consisted of 134 trees, 143 shrubs (67 shrub species and 76 species of saplings) and 239 herbs (93 herb species, 33 climber species and 113 species of seedlings). Homegardens had the highest species richness (475 plant species) belonging to 234 genera under 90 families. This was followed by agrisilvicultural systems (101 spp., 43 genera, 29 families), and the least was in tea gardens (79 spp., 41 genera, 25 families). The highest average number of plant species per system was recorded in homegarden (108.96 ± 5.96, range 23–207 spp.). A negative correlation was found between the agroforestry system plot size and plant species richness. Sorenson's similarity index showed a very low degree of similarity in the plant species recorded among the three selected systems. Out of 516 plant species recorded across the different agroforestry systems, 1.0% species (n = 3) were vulnerable (*Aquilaria malaccensis, Saraca asoca* and *Santalum album*), 8.9% species (n = 46) were least concerned, 1.6% species (n = 8) were data deficient and 88.6% species (n = 457) were not assessed. Only homegarden recorded all the three plant species under the vulnerable category of IUCN Red List. It can be concluded that the agroforestry systems, specially the homegardens harbour rich plant diversity and act as miniature versions of natural forests by conserving rare, threatened and data-deficient plant species. The results suggest that the agroforestry systems with some management interventions need to be promoted as conservation models in areas with high pressure on tropical forests.

Keywords Assam · Agroforestry system · Homegardens · Tea gardens · Plant species richness

Introduction

Traditionally, the farmers have been known to retain tree cover in agricultural landscapes, around home spaces and in cash crop plantations as shade trees. Apart from these traditional practices, the increasing rate of tropical deforestation has led to an increase in number of forest or secondary forest growth fragments intermingled with human-managed landscapes consisting of agriculture and plantations. These current forms of land-uses usually known as agroforests have now become the prominent landscapes which have a potential of conserving the natural and native vegetation [25]. These agroforestry systems not only provide food, fruits, vegetables, medicines and fuel but also

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s40003-020-00525-9) contains supplementary material, which is available to authorized users.

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Agroforestry, College of Horticulture and Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India

[2] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh, India

[3] Department of Forestry, NERIST, Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Published online: 17 March 2021

Proc Zool Soc
https://doi.org/10.1007/s12595-021-00361-x

RESEARCH ARTICLE

Conservation of Wildlife Diversity in Agroforestry Systems in Eastern Himalayan Biodiversity Hotspot

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 14 January 2020 / Revised: 22 February 2021 / Accepted: 1 March 2021
© Zoological Society, Kolkata, India 2021

Abstract The highly diverse tropical forests are fast being depleted and converted into isolated fragments which endangers the existence of wild animals. These fragments are interconnected by human-dominated agroforestry systems. To conserve the wild animals it is important that such agroforestry systems have the potential habitat to support the survival of the enormous regional biota. The present study was carried out in agroforestry systems (agrisilviculture systems, home gardens and tea gardens) in Assam to understand their role in conservation of different biological groups (mammals, birds, butterflies, reptiles and frogs). Total visual count method was deployed in home gardens and agrisilviculture system and line transects were laid in tea gardens for recording the faunal diversity. Altogether, 364 animal species (consisting of 14 mammal species, 185 bird species, 133 butterfly species, 18 reptilian species and 14 amphibian species) were recorded from the selected study sites of agroforestry systems. The highest animal diversity was found in home garden (311 spp.), followed by tea garden (275 spp.) and agrisilviculture system (187 spp.). Out of the 364 species recorded, only 1.09% were threatened (endangered and vulnerable) species and 1.37% were near threatened species according to the IUCN Red List. Wild animal species richness was significantly and negatively associated with distance from forest and positively associated with fruiting and flowering vegetation. Thus, the agroforestry systems with their flowering and fruiting vegetation, though cannot substitute the forest habitat but can be useful in providing shelter to the generalist species and their populations.

Keywords Home gardens · Tea gardens · Agrisilviculture systems · Mammals · Birds · Butterflies

Introduction

Highly diverse ecosystems like the tropical forests, are being converted or deforested for agricultural expansion, developmental projects and land-use intensification (Pastur et al. 2012). It has resulted in habitat loss, degradation, fragmentation (Harris and Silva-Lopez 1992) leading to biodiversity loss (Flynn et al. 2009). One possible and effective solution to conserve biodiversity may be to manage the remaining contagious forest areas as protected areas and manage the human-dominated agricultural landscapes (Schroth et al. 2004) by adopting age-old methods of agroforestry. Agroforestry is the intentional growing of woody perennials along with annual crops and/or animals in the same unit of land (Nair 1993). Assam, a part of Northeast India region falls under the east Himalayan biodiversity hotspot. This state has abundant forms of agroforestry systems in place since ancient times. Ahmed and Hazarika (2007) broadly classified the agroforestry systems present in Assam into five types namely, Agri-horticultural system (*Ricinus communis*/*Sesamum indicum*/

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12595-021-00361-x.

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Silviculture and Agroforestry, College of Horticulture and Forestry, ANDUAT, Uttar Pradesh, Ayodhya, India

[2] Department of Zoology, Kalinga University, Raipur, Chhattisgarh, India

[3] Department of Forestry, NERIST, Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Published online: 19 March 2021

Proc Zool Soc
https://doi.org/10.1007/s12595-020-00335-5

RESEARCH ARTICLE

Agroforestry Systems: A Boon or Bane for Mammal Conservation in Northeastern India?

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 28 December 2019 / Revised: 15 June 2020 / Accepted: 24 June 2020
© Zoological Society, Kolkata, India 2020

Abstract The degradation, fragmentation and isolation of tropical forests have led to the formation of small patches of human dominated landscapes interspersed with forest fragments. This affects the wildlife habitat and its population negatively. These human landscapes have been observed to have agroforestry systems as a dominant cropping practice in Assam, India. The present study was carried out in agroforestry systems (agri-silviculture systems, home gardens and tea gardens) to understand their role in the conservation of mammal species. Line transects and camera traps were used for recording mammal diversity. Altogether, 17 species of mammals belonging to 16 genera and 14 families were recorded in the selected agroforestry systems. The highest species richness was found in the home gardens (14) and the lowest was found in the agri-silviculture system (10). Home garden had the highest mammal encounter rate and relative abundance. Only five species of mammals were recorded through camera trapping. According to the IUCN Red List, 6% of mammal species recorded in the selected agroforestry systems were endangered or near threatened and 18% were vulnerable. The highest hunting trap encounter rate was found in tea garden (139 traps, 0.181 traps km^{-1}, 24 captures). Distance from forest was inversely proportional whereas hunting threat was directly proportional to mammal species richness. The only and strongest predictor of mammal species richness was hunting threat which accounted for 53.5% of variation in mammal species richness in the study area, implying that the agroforestry systems are capable of conserving species if hunting pressure is reduced. Therefore, promotion of alternative livelihood and formation of community conservation groups are needed to increase and protect the mammalian diversity in these agroforestry systems. Thus, agroforestry systems can act as a suitable habitat next to forests for the dwindling wildlife population.

Keywords Agri-silviculture · Home garden · Tea garden · Mammal diversity · Hunting threat

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India

[2] Department of Zoology, Kalinga University, Raipur, Chhattisgarh, India

[3] Department of Forestry, North Eastern Regional Institute of Science and Technology (Deemed to be University), Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Introduction

Agroforestry systems (practice of combining trees with agricultural crops) are known to contribute in wildlife conservation owing to their structure and vegetation composition. Schroth et al. (2004) identified three roles of agroforestry in biodiversity conservation namely, provision of alternative habitats for generalist species, reduction of primary forest conversion rates and conservation of wildlife populations by connecting isolated habitat remnants. The various types of agroforestry systems like live fences, riparian forests and shade-grown crops etc. have been known to provide habitats for animal species such as moths (Ricketts 2001), birds (Greenberg et al. 2000; Klein et al. 2003; Bos et al. 2007; Schroth and Harvey 2007), terrestrial mammals (Estrada et al. 1994) and bats (Estrada et al. 1993; Faria and Baumgarten 2007). Gallina et al. (1996) has studied the mammalian diversity in coffee agroforestry

Published online: 09 July 2020

Acta Acustica united with Acustica
Vol. 105 (2019) 294 – 300

DOI 10.3813/AAA.919312

Vocal Adjustments in Purple Sunbird (*Cinnyris asiaticus*) at Noisy Habitats

Manoj Singh[1)], Akash Jaiswal[2)], Yashmita Ulman[3)], Krishan Kumar[4)]
[1)] Department of Zoology, Kalinga University, Raipur, India
[2)] School of Life Sciences, Jawaharlal Nehru University, New Delhi, India
[3)] Department of Forestry, Guru Ghasidas University, Bilaspur, India
[4)] School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India.
krishan_kumar@mail.jnu.ac.in

Summary
This study examines the purple sunbirds' (*Cinnyris asiaticus*) vocalizations in different habitats to assess the vocal adjustments made by the bird to avoid masking of its acoustic signals in noisy conditions. Sampling of acoustic signals of purple sunbird at different sites was done at sites with varying background noise levels by simultaneously recording the audio samples as .wav files, and the corresponding sound pressure levels. We identified twelve different types of vocal signals in purple sunbird based on their morphological appearance in the spectrogram. Correlation analysis between background noise levels and spectral parameters of most of these signals showed weak and statistically non significant association between them. However, a statistically significant positive association was found between song amplitude and background noise levels. While our results support the presence of Lombard effect in purple sunbird vocalizations in noisy conditions, they do not seem to suggest any associated changes in spectral content in such conditions.

PACS no. 43.80.-n

1. Introduction

Globally expanding urban perimeters and fast developing transportation network have been associated with increasing anthropogenic noise [1]. It is now well known that increased noise levels in urban habitats may mask acoustic communication in many bird species, and can cause changes in their acoustic behavior [2, 3, 4, 5, 6]. Birds rely on acoustic communication for a variety of functions such as mate attraction, territory marking, predator alarm, begging for food, contact with neighbours, availability of food and for many other functions [7, 8, 9, 10]. Hence, their survival and reproductive success are adversely influenced by increase in the background noise which tends to mask bird vocalizations [11, 12, 13, 14].

Birds adjust their vocal behavior in different ways to overcome the negative effects of noise on signal communication. This includes shifting the vocalization temporally to quieter periods [15], increasing signal repetition [16], raising the amplitude i.e. Lombard effect [17, 18, 19, 20, 21] and altering the spectral content [22] of vocalization. Among these, the latter two strategies i.e. raising the amplitude and altering the spectral content have drawn considerable attention of researchers across the world.

Slabbekoorn and Peet (2003) reported frequency adjustment in great tits (*Parus major*) in the city of Leiden (The Netherlands) where individuals in territories with higher noise levels were found to sing songs at raised minimum frequencies [22]. Since then, this strategy of song frequency adjustment has been reported repeatedly in many other studies. For instance, similar frequency shift was also reported in other populations of great tits (*Parus major*) [5, 23, 24, 25], song sparrows (*Melospiza melodia*) [26], house finches (*Carpodacus mexicanus*) [27, 28], chiffchaffs (*Phylloscopus collybita*) [29], black-capped chickadees (*Poecile atricapillus*) [30]. Interestingly, many of these studies report that it is the minimum song frequency that is shifted upwards, presumably as a response to avoid signal masking by the low-frequency traffic noise.

However, Brumm and Zollinger (2011) argued that these studies did not measure the song amplitude and that such frequency changes may occur in association with Lombard effect as a byproduct [31]. They suggested that increase in the vocal frequency occurs involuntarily when the bird makes effort to be heard in noisy conditions by raising its amplitude. Such an increase in the vocal frequency coupled with the Lombard effect was reported in budgerigars [32], tinamous [33] and mallards [34], which are non-songbirds. However, other studies [35, 36, 37] reported the absence of such association between Lombard effect and frequency shift in songbirds. Dorado-Correa *et al.* (2018) suggest that songbirds might have developed the capacity to decouple the amplitude and frequency during the Lombard effect [34].

Received 1 August 2018,
accepted 22 January 2019.

© S. Hirzel Verlag · EAA

FEED ANALYSIS LABORATORY: REDUCING COSTS, BOOSTING PROFITABILITY AND STRENGTHENING AGRIPRENEURSHIP

V.K. Singh, R.K. Joshi, D. Tewari and S. Gautam
College of Veterinary Science & Animal Husbandry
Acharya Narendra Deva University of Agriculture & Technology
Kumarganj, Ayodhya-224229 (U.P.)

Livestock sector forms an important livelihood activity through supporting agriculture and supplementing incomes of the farmers. In India, livestock production and agriculture are intrinsically interlinked, and crucial for overall food security of people. It forms an important livelihood activity for most of farmers, supporting agriculture in the form of critical inputs, contributing to health and nutrition of household, supplementing incomes, offering employment opportunities, and finally being a dependable "bank on hooves" during adverse conditions.

A shift from agriculture to agribusiness is an essential pathway to revitalize Indian agriculture and to make more attractive and profitable venture. Agripreneurship have the potential to contribute to a range of social and economic development such as employment generation, income generation, poverty reduction and improvements in nutrition, health and overall food security in the national economy. Skill development of producers, laboratory technician and resource persons for sampling and chemical testing of feed ingredients and prepared products should be trained for quality control are actually the nerve centre of a reliable product. Agripreneurship has potential to generate growth, diversifying income, providing widespread employment and entrepreneurial opportunities in rural areas. Animal Nutrition is the science of feed preparation and feeding i.e. how feeds should be prepared and fed to animals to produce adequate and safe food and non-food materials such as wool or manure. Animal feed influences all livestock sub-sectors across production systems from animal reproduction, health and welfare – to farm economic viability, environment, animal product safety, quality, human nutrition, poverty, food prices and global economy.

Feed has a fundamental influence on productivity, health and welfare of the animal. Animal feeding impacts on many areas of agriculture: productivity, environmental emissions, water pollution, land use, animal health, product safety, product quality and animal welfare. Every sector of the livestock industry is influenced by animal feeding. Proper animal feeding is the supply of a diet balanced in all nutrients and free from deleterious components, at a level that meets the production objective, considering the animal's physiological state, and generates animal products that are safe for human consumption.

A sustainable animal diet framework translation into action would be beneficial for the animal, the environment and the society, and is likely to generate socio-economic benefits (FAO, 2014). Sustainable animal diets are balanced in all nutrients, free from deleterious components, meet production objective, generate animal products that are safe for human consumption and integrates the *Three-P* dimensions of sustainability (*Planet, People and*

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4462-4470

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 4462-4470
Journal homepage: http://www.ijcmas.com

Original Research Article

Influence of Dietary Incorporation of Polyherbal Mixture on Feed Intake, Haemato-biochemical Parameters and Carcass Traits in Broiler Chicken

M. Khan[1*], V. K. Singh[1], S. Gautam[1*], D. Tewari, R. Devi[2], V. B. Singh[1] and P. Singh[1]

[1]Department of Animal Nutrition, College of Veterinary Sciences & Animal Husbandry, Narendra Deve University of Agriculture and Technology, Kumarganj, Faizabad-224229, Uttar Pradesh, India
[2]Department of Livestock Products Technology, C. V. Sc. & A. H., Narendra Deve University of Agriculture and Technology, Kumarganj, Faizabad-224229, Uttar Pradesh, India
**Corresponding author*

ABSTRACT

The present study was conducted to discern the influence of dietary incorporation of polyherbal mixture (turmeric, mangrail, ashwgandha and punarnava) as feed additive on feed intake, haemato-biochemical parameters and carcass traits in "Vencobb 400Y" strain for 42 days. Day old broilers chicks(n=210) were procured and randomly divided into seven groups with six replicates of five chicks each.T_1 and T_2 were control (basal diet) and negative control (basal diet + antibiotics), respectively.T_2, T_3, T_4, T_5, T_6 and T_7 were the treatment groups, supplemented with 0.25, 0.5, 1.0, 1.5 and 2 percent polyherbal mixture along with basal diet, respectively. Body weight, feed intake, haemato-biochemical parameters and carcass traits were observed. At the end of the six weeks the body weight gain was significantly highest in 2% polyherbal mixture supplemented group (T_7). The feed intake of all the groups was significantly lower than control group, however it was significantly lowest in antibiotic supplemented group. Gain to feed ratio was significantly ($P<0.05$) higher in polyherbal supplemented groups than control, and was similar to negative control group broilers. The hemoglobin level and PCV % in T_6 and T_7 was significantly ($P<0.05$) higher than all groups except, control group and was highest in T_7 group birds. The mean WBC count was significantly higher in all the groups than T_1. The H: L ratio was lower in all the groups in comparison to control group and was lowest in T_7 among the polyherbal groups. The total serum cholesterol level was significantly ($P<0.05$) lower in T_6 and T_7 group than all other groups. The carcass parameters viz; dressed, eviscerated, giblet, drawn, liver, heart gizzard and drumstick yields were similar among the treatments. Therefore, incorporation of 2% polyherbal mixture in broiler chicken diet improved feed intake and performance. Lower values of biochemical parameters and increased carcass parameters with incorporation of 2% polyherbal mixture indicated the better health condition of the broilers.

Keywords

Broiler chicks, polyherbal mixture, feed intake, haemato-biochemical paremeters and carcass traits

Introduction

The basic objective of modern broiler faming is faster growth, high feed conversion efficiency and livability. Commercial poultry is being genetically selected for even increasing growth performance and efficiency. This selection for increased growth rate has resulted to changes in the gastrointestinal development

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 7 [2] January 2018 : 29-35
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

ORIGINAL ARTICLE **OPEN ACCESS**

Effect of Polyherbal Mixture on Growth, Carcass characteristics and Sensory Quality of Meat in Broilers Production

V.B. Singh, V.K. Singh*, D. Tewari, S. Gautam, P. Singh and S. Chaturvedi
Department of Animal Nutrition
College of Veterinary Science and Animal Husbandry
Narendra Deva University of Agriculture and Technology
Kumarganj-224 229, India
*E-mail: vksinghnduat@gmail.com

ABSTRACT

A study was conducted to assess the effect of polyherbal mixture as a replacement antibiotic in broilers. Day-old commercial broiler chicks (n=250) were distributed equally into five groups of 50 chicks each, which were further replicate to five groups of ten chicks each over a period of 6 weeks. The chicks were placed on one of the five dietary treatments- NCON (basal diet),PCON (basal diet + antibiotics), NGP-1.0 (basal diet + 1% polyherbal mixture), NGP-1.5 (basal diet + 1.5% polyherbal mixture)andNGP-2.0 (basal diet + 2% polyherbal mixture).Body weight and feed intake were recorded weeklyand accordingly feed conversion ratio were calculated. At the end of 6th week 5 birds per treatment were sacrificed to determine the carcass characteristics and sensory quality of meat. The heart weight and gizzard weight exhibited some differences between groups but herbal supplemented birds had significantly (P<0.05) higher spleen weight in comparison to NCON and PCON group birds. Weights of pancreas showed differences between herbal treated groups but did not observed any variation with NCON and PCON group birds. Herbal supplemented bird's viscera weight was similar to NCON but lower to PCON group birds. Drumstick weight of NGP-1.0 group birds was significantly (P<0.05) higher to NCON birds. Breast portion of the broilers in herbal supplemented birds were similar and significantly (P<0.05) higher than NCON and PCON birds breast. Wing portion of NGP-1.5 group had lower wing weight than PCON birds. Although statistically similar but mean sensory scores for appearance and flavour were slightly better in NGP-2.0 group than the NCON and PCON groups. Data showed that broiler's meat consistency was significantly (P<0.05) better in herbal groups in comparison to NCON group.The overall acceptability of NGP-2.0 group broiler's meat is significantly higher than NCON bird's meat No differences existed in the proximate principles of thigh and breast meat in different group birds. It was concluded that polyherbal mixture at level of 2% supplemented in the diet of birds showed potential to improve body weight, feed conversion ratio and sensory quality of broiler's meat and may prove a good alternate to AGP's for commercial broiler production.

Keywords: *Broiler, carcass, herbal mixture, meat and sensory*

Received 12.10.2017 Revised 11.11.2017 Accepted 18.12.2017

INTRODUCTION

The history of herbs is as long as the story of mankind, for people has used these plants since earliest times. Wars have been fought and lands conquered for the sake of plants, and even today we continue to depend on exotic species for many of our newest medicines and chemicals [25]. Recently, many countries tended to minimize or prohibit the chemical components for their deleterious side effects on both animals and human. So, it is important to use natural promoters.

The emphasis here is on those herbs that, when used to supplement feeds, are helpful in achieving the objectives of improving growth performance, improving immunity response, improving intestinal microflora and controlling particular diseases; in other words the focus is on multifunctional herbs. Some important herbs are turmeric, mangrail, garlic, methi, aloe vera, ashwagandha, bhuiamla, punarnava, neem and tulsi.

Turmeric *(Curcuma longa)* have antifungal, immunomodulatory, antioxidative, antibacterial and nematocidal activities [17]. It is demonstrated that black cumin *(Nigella sativa)* seeds have considerable antioxidant, antibacterial, digestive and appetite stimulant, hepatoprotective and immunomodulative

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 2831-2837

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 2831-2837**
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of a Phytogenic Feed Additive Supplemented Diet on Economic Efficiency and Cost of Production of Broiler Chickens

V.B. Singh*, V.K. Singh, D. Tiwari, S. Gautam, Ruma Devi, S.P. Singh, S. Chaturvedi and P. Singh

Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224 229, Faizabad (U.P.), India
**Corresponding author*

Keywords

Broiler, Economic efficiency, Herbal powder, Production cost

ABSTRACT

The aim of this work was to compare the efficacy of a phytogenic feed additive (PFA) on the economic efficiency and cost of production of broiler chickens. Two hundred fifty Vencobb 400Y day old chicks were distributed equally into five groups of 50 chicks each, which were further divided into five replicate of ten chicks each. The chicks were placed on one of five dietary treatments i.e. basal diet without any supplement (NCON) or with antibiotic (PCON) and NARGROPHYT at 1.0% (NGP-1.0), 1.5% (NGP-1.5) and 2.0% (NGP-2.0). The effect of these supplements on economic efficiency and cost of production was assessed in a six week study. Feed productivity were significantly ($P<0.05$) higher in NGP-1.5, NGP-2.0 and PCON than NCON group. The cost productivity of phytogenic treated birds similar to NCON group, however significantly ($P<0.05$) lower than PCON group birds. The feed price ratio and feed productivity of NGP-1.5 and NGP-2.0 had significantly ($P<0.05$) higher value than NCON but similar to PCON group. Benefit: cost ratio of herbal treated groups was similar to NCON, however significantly ($P<0.05$) lower than PCON group birds. The feed cost per kg body weight gain was significantly ($P<0.05$) higher in NCON followed by NGP-1.0, NGP-1.5 and NGP-2.0. Feed cost per kg body weight gain of NGP-2.0 was similar to PCON group. Economic efficiency index (EEI) was highest in PCON which was similar to NGP-2.0. NGP-1.0 and NGP-1.5 posses significantly ($P<0.05$) higher EEI than NCON. Cost index (CI) in NGP-2.0 and PCON was also similar. The return on feed was similar in NGP-1.5 NGP-2.0 and PCON group and significantly ($P<0.05$) higher in comparison to NCON. Gross return of herbal treated groups was similar to PCON; but significantly ($P<0.05$) higher than NCON group. Return on investment of herbal treated groups were similar to NCON but significantly ($P<0.05$) lower than PCON group. Profitability, profitability index (PI) and return on investment of PFAs supplemented groups was similar to NCON, however significantly ($P<0.05$) lower than PCON group. The break even output values of Phytogenic mixture supplemented groups were similar to NCON, however significantly ($P<0.05$) higher than PCON group. The EE, REE-NC and REE-PC of herbal supplemented groups were similar to NCON group. However, the values were significantly ($P<0.05$) lower than PCON group. So it can be concluded that 2.0% phytogenic feed additives in broilers feed can be an effective alternative of antibiotic growth promoters.

LEAD PAPER

NUTRITIONAL APPROACHES TO MITIGATE GREEN HOUSE EMISSION THROUGH ANIMAL HUSBANDRY PRACTICES

Nidhi Verma, Dharmesh Tiwari, Sachin Gautam and Jadhav Akshay Waghamber
Nutrition, Acharya Narendra Deva University of Agriculture and Technology,
Kumarganj-Ayodhya, India- 224229.
*Presenting/Corresponding author, e-mail: vksinghnduat@gmail.com

society is closely associated with the climatic conditions. An eco-friendly climatic condition influences the productivity of living beings. Modernization and advanced lifestyle are creating serious threats to the However, animal husbandry practices are also hidden contributors to the environmental safety. Current Gases (GHGS) are witnessed and future catastrophic scenario of such life threatening GHGs cannot be livestock population of our country is significant contributor of GHGs through anaerobic microbial and ultimately remarkable loses of costly feeding inputs. Thus, under mentioned useful nutritional or dietary supplementations to influence the eco-friendly animal husbandry practices are compiled to productivity and environmental hygiene.

safety. Dietary supplementations, Green house gases (GHGs), Nutritional approaches.

environmental condition influences the life expectancy and reproducibility of livestock and the food chain and disease free status of society might be possible due to the pollution free environmental the ancient time period, people were closely associated with the nature, and the natural conditions sustainability. However, currently environmental conditions are getting deteriorated owing to the and scientific interventions in all the aspects of livestock and human society. Green House Gases carbon dioxide, CFCs, methane, nitrous oxide and ozone traps infrared radiation in the atmosphere which leads to global warming, *i.e.* "greenhouse effect". Approximately 1/5th of the greenhouse increasing atmospheric methane concentrations. Methane is a potent GHG because of its higher (21 CO_2) potency and longer half life (persist for 12 years in environment). Next to CO_2, methane is the anthropogenic greenhouse gas (IPCC, 2007). Apart from vehicles, factories and machineries etc, animal practices and agricultural sector are also huge methane emitters through flooded paddy fields, enteric ruminants. Global quantitative analysis of methanogenesis through livestock sector, *viz.*, cattle, sheep contribute 86 million metric tonnes (Tg) of methane emissions per year. Furthermore, approximately is from dairy sector, 55.9 Tg emission from beef cattle and 9.5 Tg from sheep and goats (Mc Michael Global yearly methane contribution through buffalo is around 6.2-8.1 Tg and 0.9-1.1 Tg from camels. methane production within the hindgut of pigs and horses is approximately 0.9-1.0 Tg and 1.7 Tg, Johnson, 1996). On an average, domestic ruminant contributes 22% of the anthropogenic methane 15% of total global methane emissions. Thus, methanogenesis varies species-wise owing to different microbial mass and microbial fermentation (Johnson *et al.*, 1994).

dietary energy losses in the form of methane in dairy cattle, range-cattle and feedlot cattle varies from 7.5% and 3.5-6.5%, respectively. In buffalo and camel, a loss of diet energy in the form of methane 7.5-9.0% and 7.0-9.0%, respectively. Estimates of methane losses from ruminants also varies with feed quality, feed intake, feed composition and the processing of the feed (Johnson *et al.*, 1996). trations of carbon dioxide (65%), methane (26-27%), nitrogen (7%), traces of oxygen (0.5%) and a little %) are emitted through rumen fermentation (Hungate *et al.*, 1970). The primary gaseous end product of tation is carbon dioxide and its significant concentration is further reduced to methane. Methane is he rumen and hindgut of animals by a group of *methanogenic archaea*, which belong to the phylum Such archeal population utilizes carbon dioxide and hydrogen produced during carbohydrate

Indian J. Anim. Nutr. 2019. 36 (1): 58-64
doi: 10.5958/2231-6744.2019.00010.0

Indian Journal of Animal Nutrition

Performance of Broiler Chicken Fed Diets Supplemented with a Phytogenic Mixture

V.V. Singh, V.K. Singh*, D. Tewari, S. Gautam, V.B. Singh and P. Singh
Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry,
Narendra Dev University of Agriculture & Technology, Kumarganj-224229, Ayodhya, Uttar Pradesh, India

ABSTRACT

Two hundred fifty (Vencobb-400Y strain), day old broiler chicks were randomly divided into 5 groups of 50 birds each. Each group was further divided in to 5 replicates of 10 birds each. These were kept either on basal diet without any supplement (NCON), basal diet with antibiotic (PCON), basal diet with 1% phytogenic mixture (LPH), basal diet with 2% phytogenic mixture (MPH) and basal diet with 3% phytogenic mixture (HPH) for 35 days in order to evaluate the effect of a phytogenic mixture on the performance of broiler chicken. The phytogenic mixture supplemented group's birds had higher body weight than the control group birds and the mean body weight of LPH, MPH and HPH was higher (P<0.05) than NCON group. After 35 days of experimental period, it was found that the total feed intake of phytogenic supplemented birds was similar to NCON group but higher than that of PCON birds. Among the phytogenic mixture supplemented birds, lowest feed intake was observed in MPH group. Among the herbal supplemented groups, lowest FCR was found in MPH group and it was similar to PCON group. The energy efficiency ratio (EER) of herbs supplemented groups was higher (P<0.05) than NCON group but lower than that of PCON group. The protein efficiency ratio (PER) of phytogenic mixture supplemented birds was better (P<0.05) than NCON group and lower than that of PCON group. Among herbal groups, the highest PER was found in MPH group. The performance index of phytogenic mixture supplemented birds was higher (P<0.05) in comparison to NCON birds. Rearing of broilers supplemented with phytogenic mixture was more economical than NCON group but less economical than the birds reared on conventional system of rearing *i.e.* on AGP. Therefore, 2% phytogenic mixture was economical and has potential to use as an alternative to AGP in broiler rearing.

Key words: Broiler, Chicken, Economics, Growth Performance, Phytogenic mixture

INTRODUCTION

Broiler chicken grow very fast and it is ready for marketing within 35-42 days. The rapid growth rate in broilers imposes severe stress on birds which leads to poor performance, immuno-suppression and high mortality (Xie and Song, 2005). To reduce stress in birds, antibiotics are added in feed. But the European Union in January, 2006 banned the majority of commercial antibiotic growth promoters used in poultry feed in order to protect consumer health. This has led to the interest in finding alternatives to antibiotics for poultry production (Hassan *et al.*, 2011).

Herbs can serve as safer alternatives as growth promoters due to their suitability and preferences, reduced mortality, reduced risk of diseases, minimum health hazards and environment friendliness. Our country abounds in herbal plants having pharmacological properties which needs exploitation by the modern methods. Tulsi (*Ocimum sanctum*) is an analgesic and antistress agent and has antimicrobial, anti-inflammatory, immuno-stimulant and anti-oxidative property (Singh *et al.*, 2014). Neem (*Azadirachta indica*) leaves have different medicinal properties like immunostimulant, antiviral, antibacterial, antifungal, hepatoprotective and antiprotozoal, and has no side effects (Ong *et al.*, 2014). Sahijan (*Moringa oleifera*) leaves are good sources of fats, proteins, minerals and have antimicrobial effects (Olugbemi *et al.*, 2010). Eucalyptus is a well known medicinal plant because of its biological and pharmacological properties. It has antibacterial activities against *Salmonella, Klebsiella, Streptococcus, Proteus, Staphylococcus and Escherichia* coli (Hassan *et al.*, 2011). Giloy *(Tinospora cardiofolia)* also known as guduchi has immune-potentiating, antibacterial, antidiabetic, analgesic and antioxidant properties. It has hepatoprotective effect

*Corresponding author : E-mail: vksinghnduat@gmail.com

International quarterly journal in Science, Agriculture & Engineering

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swarup[1], P.S. Pramanik[1], K.D. Singh[1], A.K. Verma[1], Vishuddha Nand[1] and A.K. Srivastav[2]
[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilised to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl). Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N:L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tramadol (T_T) and lignocaine + tramadol (T_{L-T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h, PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.13±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because hornless cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Goosewardene and Hand, 1991; Faulkner and Weary, 2000; Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with researched methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978). The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Bengtsson *et al.* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al.* 1999). The Council of Europe recommends the use of anesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L-T}). Medication was done 5-10 minutes before disbudding. Two doses of ligocaine per bud were injected for cornual nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (^{0}F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

...ON &TTEPUR NOGAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
...reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

...SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

...ingh[2], P. S. Parmanik[2], A.K.Verma[1] and A.K.Srivastav[3]
...of Livestock Production Management
...Department of Animal nutrition
[2]Department of L.F.C
College of ... Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

To assess the ... score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of ... at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<... 3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly ... higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score ... was correlated negatively with BCSC and positively with BCSL.

Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

...Milk quality is as significant as the milk quantity in dairy animals. ...High yielding dairy cows had higher incidence of mastitis that can be ...determined by ... of milk (Kehrenkedeen and ...Bryce, 2007). ... cow is important for ...attaining ... higher body reserves ...may pose ... higher SCC in milk ...respectively ... dairy cows exhibit ...negative ... may influence both ...immune ... that predispose the ...animals to ... a favourable correlation ...with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. ...ence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), Production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). The SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as SCS=$\log_{10}$SCC (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly ($P<0.05$) among the three groups of cows. The BCS during calving to 15 days were significantly ($P<0.05$) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al*., 2000, Friggens *et al*.,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3≤BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
0	2.83^{cA}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
30	2.63^{b}±0.12	2.82^{abB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
60	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
90	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
120	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: ($P<0.05$)
Values with different superscripts capital letter in a column differ significantly: ($P<0.05$)

ISSN 2277-7601
& Engineering

STUDIES AMONG

224229 (UP)
& T., Pantnagar

the basis of phenotypic performance or observed
milk yield.
maintained at GLF, Chak Ganjaria, Lucknow
mation of sires, relationship between Estimated
least-squares and best linear unbiased prediction
the breeding value of sires estimated from first
). Therefore, the daughters of the sires selected on
milk yield. The product moment correlations among the
ranged from medium to very high and highly significant

Introduction

Cattle rearing
closely
The agriculture and
per cent of the Gross Domestic
Production. The
and livestock are the main source of
employment in
and about 52 per cent of the population is
engaged in agriculture and rearing of livestock in our country.

The effectiveness of sire evaluation is the backbone of any breed improvement programme. This investigation was planned to evaluate Sahiwal sires as its performance is remarkable in hot climate and has been recognized worldwide as one of the best milch breed (Ilatsia et al., 2011). Various sire evaluation methods viz. daughter's average, least-squares analysis and best linear unbiased prediction (B.L.U.P.) were used to evaluate the sires and their effectiveness were compared for Sahiwal cattle. The information on the production of first lactation is mainly required for getting genetic improvement through selection, since it serves as an index of life time production in dairy cows. Therefore, it is very much essential for the sire evaluation to correlate the first lactation milk yield with life time milk production.

Materials and Methods

The data for the present investigation were collected over a period of 71 years (1944-2014) from pedigree sheet of 1367 Sahiwal cows born to 112 sires maintained at Government Livestock Farm, Chakganjaria, Lucknow (U.P.). Only the sires having the records on at least three or more daughters were included in the present study. The total duration of the present study was divided into 8 periods.

Out of 8 periods 7 are of 9 years each and 8th period of 8 years only. Each year was divided into three seasons namely winter (November-February), Summer (March- June) and Rainy (July- October). In order to classify the data for different periods and seasons year and season of calving was considered for all the traits.

Statistical Analysis

Rank correlation

After estimation of breeding value of sires, the sires were given rank as per their genetic merit. The Spearman's rank correlation between breeding values of sires derived by various methods was used to judge the effectiveness of different methods. The rank correlation was estimated as per methods developed by Steel and Torrie (1960).

$$r_s = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$

Where,

r = Rank correlation coefficient

n = Number of sires under evaluation

d_i = Difference of rank between paired items under two methods

The significance of rank correlation was tested by t-test as given below

$$t = r\sqrt{\frac{(n-2)}{(1-r^2)}}$$

It was compared with t-table value with (n-2) degree of freedom.

Simple product moment correlations

The simple correlations (r) between the estimated breeding values of bulls by different sire evaluation methods were also calculated by the following formula:

$$r_{(XY)} = \frac{\text{Cov}(XY)}{\sqrt{[\text{Var}(x)\ \text{Var}(Y)]}}$$

Where,

$$\text{Cov}(XY) = \sum XY - \frac{(\sum X)(\sum Y)}{n}$$

$$\text{Var}(X) = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$\text{Cov}(Y) = \sum Y^2 - \frac{(\sum Y)^2}{n}$$

Where,

X, Y= The breeding value of sires estimated by two different methods

n= Number of pairs of breeding value

Rank correlation

The rank correlations of most efficient method (LSM) of sire evaluation for LTMY was statistically highly significant ($P<0.01$) with their values 1.00 ($\bar{D}$ and LSM), 0.71 ($\bar{D}$ and BLUP) and 0.71 (LSM and BLUP). For LTLL, the rank correlation between the different methods were 1.00 ($\bar{D}$ and LSM), 0.79 ($\bar{D}$ and BLUP) and 0.79 (LSM and BLUP). The rank correlation of estimated breeding values of LTMY between daughter's average and least squares method was very high (100%) (Table-1).

It revealed that ranking of sires for the estimated breeding value by daughter's average and least-squares method was similar while ranking of sires from BLUP was different. Similarly, for the LTLL, the rank correlation of estimated breeding values between ($\bar{D}$) and LSM was very high (100%). It revealed that ranking of sires for the estimated breeding value by $\bar{D}$ and LSM was similar while ranking of sires by BLUP was different.

Product moment correlation

The product moment correlations of most efficient method (LSM) of sire evaluation for LTMY with other two methods of sire evaluation (

ISSN 2277-7601
Agriculture & Engineering

Heritability estimate of post-partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non-significant and the variation in PPO accounted for due to sires was very small (8.7%) in total variation. The findings were indicative of zero heritability for this trait in these animals. Similar observations were reported by Prasad (1958) for Tharparkar cattle and Singh et al., (1964) for Hariana cattle.

Conclusion

Any selection programme based on post-partum oestrus interval will not prove beneficial in these cattle because the genetic variability for this character in these animals does not seem to exist. In view of the above observations, improvement in managemental practices may lead improvement in this trait.

References

Acaraya, R.M.; Dhillon, J.S. and Agrawal, S.C. (1971). A note on the factors affecting post-partum oestrus interval in Hariana cattle. Indian J. Anim. Sci. 41 (7) : 524-525.

Arora, K.L.; Tomar, S.S. and Singal, S.P. (1971) Factor effectin the reproductive efficiency of Hariana cattle the duration of post-partum breeding interval. The Indian Veterinary Journal **48**: 1015-1019.

Joshi, B.K.; Tantia, M.S.; Kumar, P.; Gupta, Neelam; Vij, P.K.; Nivsarkar, A.E. and Sahai, R. (1995). Hariana cattle a monograph on breed characterstics. NBAGR Research Bulletin No (3), NBAGR P.B. 129, Karnal-132001, India.

Khanna, Neetu (1998). Studies on certain aspects of reproductive performance in Hariana and crossbred cattle. M.V.Sc. thesis in Vet. Obstetrics and Gynaecology submitted to C.S. Azad Univ. of Agri. And Tech. Kanpur.

Kohli, M.L. and Suri, K.R.; (1960). Longevity and Reproductivity in Hariana cattle. Indian J. of Veterinary Sci. and A.H. 27 (**1**): 105-110.

Laktuke, S.N. and Subramanium, P.; (1961). Studies on certain aspects of oestrus phenomenon in Hariana cattle. J.Reprod. Fert. **2**: 199-200.

Singh, O.N.; Prasad, J.N. and Prasad I.B. (1964). Conception rate of Hariana and Bachur cows under artificial breeding condition in the farm. Indian Vet. J. **41**: 513-520.

Tomar, N.S.; Srivastava, K.N. and Singh B.P. (1976). Heritability estimates of fertility of Hariana heifers and their age at first calving. Indian J. Ani. Health. June: 63-66.

MULTILOGIC IN SCIENCE ISSN 2277-7601
Quarterly Journal in Science, Agriculture & Engineering

LS ON BEHAVIOR OF KADAKNATH FOWLS

Singh[3], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]
Management
Farm Complex
and Breeding
Department of T.V.C.C.
U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

The present study was conducted to investigate the effect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were assumed to be significantly differed in morning, noon and evening hour interval.

Keywords: Kadaknath, feed behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are usually reared in scavenging flocks by feeding household left over and field grain and egg laste are performed over the of exotic chickens (Dinesh and Ajith, 2002). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007). Various types of litter materials like sand (shields *et al.*, 2005), Rice hulls (Grimes et al., 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of Kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26° 47' North and longitude of 82° 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54°C, and the average maximum temperature was 24.86°C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35°C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivnathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

[illegible] Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK [illegible]

[illegible]

[illegible] was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The [illegible] comprised of twelve treatments viz. T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), [illegible] through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF [illegible] FYM), T_6 (50% RDF +50% N through Poultry Manure), T_7 (50% N through [illegible] Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry [illegible] +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure), T_{11} [illegible] through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in [illegible] design with three replications. the results revealed that the maximum plant height, [illegible] and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of [illegible] were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) followed [illegible] through poultry manure and 75% RDF +25% N through FYM.

[illegible] manure, INM, growth, RDF, plant height, and leaf

[illegible]

[illegible] L.) is one of the most important winter forage crop of India, [illegible] and nutritive value. It has become a very popular as *rabi* [illegible] sent all over the country. Berseem belongs to one of the largest [illegible] and sub family faboideae. Berseem is known as [illegible] among the world. It is one of the oldest cultivated crops, [illegible] introduced into many other parts of the world. Berseem was [illegible] *et al*., 2009) [1]. It is now widespread in the irrigated regions [illegible] of the farmers conserved the berseem as hay to get cheap, [illegible] scarcity periods or early winter and summer. Berseem is a [illegible] production as well as improving soil fertility. Berseem can [illegible] thus provide feed before and during the colder months but [illegible] °C. If the winter temperature falls to 6-8° C the crop growth [illegible] nutritious, succulent and palatable fodder available for fairly long [illegible] and early summer (Chaterjee and Das, 1989) [2]. Grazing is [illegible] than cutting. The most important cultural practices that need to [illegible] maximum benefit from the forage grass-legume mixtures. The [illegible] and convert it to a usable form for plant growth is the main [illegible] 1981) [3].

[illegible] amendment that provides nutrients for growing crops and [illegible] applied widely, because it has high organic matter content [illegible] for plant growth (Ryusen *et al*., 1993) [7]. The application of [illegible] composted with rock phosphate to improve crops yield is [illegible] 2012) [8]. Fertilizers play an important role in enhancing [illegible] fertilizers are soluble and immediately available to the plants; [illegible] and fast, the price is lower and they are quite high in

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[3],Gaurav Panday[1], A.K.Srivastav[3] and R.K. Verma[4]

[1]Department of Livestock Production Management

[2] Department of Livestock Farm Complex

[3]Department of Animal Genetics and Breeding

[4]Department of T.V.C.C.

College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) eac of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly hig weight, lower feed intake and better FCR(P<0.05). The body weight of chicks raised under sand and rice hull litter did n significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand lit performance index of the earlier study period was significantly higher in paddy straw+ rice hulls followed by sand and ri respectively.

***Key words**: Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth perf of kadaknath fowls

To study the feed conversion efficiency of kadaknath fow various bedding materials

Materials and Methods:

The present investigation was carried out to study the e different litter materials on growth performance, feed gain Kadaknath fowl. The study was carried out at the poultry Teaching Livestock and Poultry farm of the College of V science and Animal Husbandry, N.D.U.A.T. Kumarganj, U.P., situated at a distance of 42 km away from Faizabad cit km away from Jagdishpur Industrial area at an altitude o above sea level and latitude of 26° 47' North and longitude o East and it falls in Eastern plain Zone of Middle Gange region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of Nove February which comprised winter season of this region. Du period, the climatic parameters have been shown in table average minimum temperature recorded during study pe 12.54°C, while the average maximum temperature was There were a few showers of rain, ranging from 62 to 123 average was 92.5 cm during this period. The topography o almost even and most of the farm area remains dry round Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding an of Kadaknath Chicks in the brooder house. Brooding was pukka floor using deep litter system. Each group of Kadakna placed in separate pens which were visually isolated from e along with provision of adequate ventilation and artificial li brooder house.

Preparation of brooder house to receive Kadaknath chic

Brooder house was properly scrubbed and cleaned at leas before the trail began. After the house, equipments were cleaned. The house was allowed to dry out thoroughly. The h equipments were fumigated using 1% formalin. Three inches litter were made on the floor. Few days before the chicks equipments were arranged in brooder house and the elect were started to adjust temperature and light. The temperatu the brooder house was slightly above 35°C. The corners of space were made rounded off with cardboard and metal chi to prevent chicks from piling up in the corner. All these pre

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF VITAMIN E AND ZINC ON CORTISOL HORMONE DURING PERIPARTUM PERIOD IN CROSS BRED COWS

Pankaj Kumar Maurya[1]*, Anjali Aggarwal[2], P. K. Choudhary[1], Pramod Kumar[1], Gulab Chandra[3], A. K. Singh[4] and Ovais Aarif[5]

[1]C.V.Sc. & A.H., N. D. University of Agri. & Tech., Kumarganj, Ayodhya (UP) India,
[2]Dairy Cattle Physiology Division, NDRI, Karnal (Haryana),
[3]COVAS, SVPUAT, Meerut (U.P.), [4]C.V.Sc. & A.H., Rewa (M.P.), [5]FVSc & AH, SKUAST K

Abstract

The study was conducted to investigate effect of vitamin E and zinc on cortisol hormone during peripartum period in Karan Fries cows. Sixteen pregnant Karan Fries (KF) cows were selected from the herd of National Dairy Research Institute (NDRI) Karnal, on the basis of their body weight, BCS and parity. Eight cows were kept in control group and other eight cows in treatment group which were supplemented with 1000 IU vitamin E and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Cortisol hormone. Body weight and Body condition score (BCS) of all the experimental animals were recorded on the day of blood collection. Plasma cortisol was significantly ($P<0.001$) lower in treatment group as compared to control group (2.98 vs. 3.10 ng/ml). There was a steady increase in the body weight of control and treatment cows towards parturition and was found a significant ($P<0.001$) difference between the control and treatment groups. The body condition score of control and treatment groups decreased by 33.05% and 17.76% respectively after calving. This showed that the control group cows lost significantly ($P<0.001$) more body condition as compared to treatment group cows. The results of this study indicated that supplementation of vitamin E and zinc have beneficial effects in changing cortisol level in this way that improves body condition and decreases the effect of parturition stress in the animals.

Keywords: Cortisol, Body Condition Score, Energy Metabolites, Peripartum period, Vitamin E, Zinc

Introduction

Cortisol is a steroid hormone that helps the body respond to stress. It is also called the stress hormone. It is released in response to stress and low blood glucose concentration. It is the principal glucocorticoid during the reproduction and lactation of cows [1]. Adrenal secretion of cortisol is modulated by a complex negative feedback mechanism involving the central nervous system, hypothalamus, pituitary and adrenals [2]. The synergistic action of endogenous cortisol along with other hormones has been found to be critical for parturition and initiation of lactation in domestic animals [3]. At term the corticosteroid concentration rises in the plasma of peripartum cows [4, 5, 6]. Plasma total cortisol level increased from 2.13 ng/ml to 2.62 ng/ml till one day prepartum and increased to 6.08 ng/ml at parturition in crossbred cows. The level decline from 3.42 ng/ml on 1 day postpartum to 2.49 ng/ml at 3 day postpartum [6]. In Murrah buffaloes level of cortisol was found 1.46 ng/ml at 30 day prepartum which increased to 3.78 ng/ml at parturition and decline to 1.89 ng/ml at 3 day postpartum[2].

Cortisol concentrations have been used as a physiological marker of stress. During heat acclimation there is reduction of plasma cortisol that helps in reduction of heat production of animals[7]. An initial increase in cortisol occurs due to acute heat stress followed by a decline after prolonged exposure in cows. The animals adjust physiologically to elevated heat loads by decreasing adrenal corticoid output [7]. Cortisol concentrations have been found lower in high producing cows at day 30 than at day 90 or in nonlactating cows due to reduced pulse amplitude. Low cortisol concentrations likely participate in the enhanced production observed in high producing cows [8]. Heat exposure at temperature above 40°C has been found to raise the cortisol level to almost double the pre-exposure levels [9]. Similar results were also found by others in hot-dry, hot-humid and winter seasons in crossbred cows (4.17, 4.35 and 2.09 ng/ml respectively) [10].

Materials and Methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). Karnal is situated on an altitude of 250 meter above mean sea level, latitude and longitude position being 29°42" N and 79°54" E respectively. The maximum ambient temperature in summer goes up to 45°C and minimum temperature in winter comes down to 0°C with a diurnal variation in the order of 15-20°C. For the present study 16 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 8 cows kept in Control group and other 8 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of vitamin E and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum. Animals were maintained in open area with asbestos roof in the sides of the open area, where the animals were offered feed. The open area had brick floor. The animals were free to move inside the controlled open area. All the animals were fed as per the standard feeding practices followed at the NDRI farm.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 1,200×g at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Cortisol.

Sample analysis

Blood sample was analyzed for cortisol. Plasma Cortisol was determined by "Cortisol EIA kit" from Cayman Chemical Company, Ann Arbour, USA. Body weight and Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two-way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software.

Results and Discussion

Cortisol

The mean±SE of plasma cortisol concentration of control cows was 2.87±0.09 ng/ml 60 days before calving and on the day of calving it increased to 3.24±0.07 ng/ml. Further, in treatment group the plasma cortisol concentration was 2.78±0.03 ng/ml 60 days before calving and on the day of calving it increased to 3.10±0.03 ng/ml. In present study, the overall mean±SEM of plasma cortisol concentration was found significantly ($P<0.001$, Table 2) lower in treatment group as compared to control group. Plasma levels of cortisol varied between 2.3-3.5 ng/ml during pre and postpartum in Holstein cows [11]. After 7 days of calving it's level started decreasing up to 60 day of lactation.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 273-280

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 273-280
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Exogenous Melatonin and Different photoperiods on Serum Glucose and Total Serum Protein levels in Chhotanagpuri Ewe.

P. K. Choudhary[1*], A. K. Ishwar[2], Bablee Jyoti[3], R. Kumar[4], D. Niyogi[5], M. Kumar[6], P. Kumar[1] and P. K. Maurya[1]

[1]Department of Veterinary Physiology and Biochemistry, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi, India
[3]Department of Chemistry, L.N.M.U., Darbhanga, India
[4]Department of Agronomy (A.H.), B.A.U., Sabour, Bhagalpur, India
[5]Department of Veterinary Pathology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[6]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
**Corresponding author*

Keywords

Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Serum glucose, Total serum protein

ABSTRACT

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. After administration of melatonin, serum glucose was decreased in group- III, IV, VI and VII in comparison to group-I, although this decrease was not statistically significant. An increasing trend of serum glucose was observed in all groups from third to fourth month. Total protein at first month was significantly ($P<0.05$) higher in group VI in comparison to 0 day. After administration of melatonin, total serum protein concentration was significantly ($P<0.05$) decreased in group VI in comparison to first month and continued up to third month. At fifth month, total serum protein was significantly ($P<0.05$) lower in group III, IV and VI in comparison to 0 day and first month.

Introduction

Sheep husbandry is backbone of rural economy in India. The Chhotanagpuri sheep is the only recognized breed of sheep found in Jharkhand with a few numbers in Bihar and West Bengal. This breed is maintained solely for mutton production. They produce coarse wool of poor quality. This is being utilized for carpet manufacturing. Sheep

Journal of Entomology and Zoology Studies 2019; 7(6): 1220-1221

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 1220-1221
© 2019 JEZS
Received: 19-09-2019
Accepted: 21-10-2019

Sandeep Yadav
M.V.Sc. Scholar, Department of Veterinary Medicine, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Vibha Yadav
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology& Biochemistry, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Management of traumatic proptosis in a pug: A case study

Sandeep Yadav, Vibha Yadav, RP Diwakar and Pramod Kumar

Abstract
A three years old male pug dog, weigh 10 kg was presented to Jai Pet Care Clinic Raebareli, Uttar Pradesh for treatment with unilateral traumatic proptosis. All clinical parameters were normal. Physical examination revealed partial prolapse of right eye globe with severe periorbital edema, haemorrhage, absence of menace and presence of miosis. Therapeutic management done by administration of triflupromazine @4mg/kg I/M for sedation, dexamethasone and gentamicine 0.2ml each in combination injected through intra palpebral route, which was repeated on 5th day. Animal was also given intramuscular injection of gentamicin @5mg/kg, dexamethasone @0.125mg/kg, vitamine B complex 2.0 ml and chlorpheniramine maleate @0.5mg/kg only once for 5 consecutive days. Eye drop of moxifloxacine and dexamethasone 4 times a day for instillation, chloramphenicol ointment 4 times a day for local application and enrofloxacin @5mg/kg orally once for 7 days were used. Animal recovered successfully after 7 days of regular treatment. Vision was assessed by simple vision testing using junction box, after 15 days of recovery and found normal.

Keywords: Pug, proptosis, therapeutic management

Introduction
Proptosis is forward displacement of globe which occur secondary to any blunt trauma to head [7]. Proptosis typically occurs in dogs following trauma to the face or head. Certain breeds of dog are more prone to eye proptosis than others because of their differences in facial conformation. The most common cause of proptosis in small breed dogs is a fight with a larger dog. During trauma, the globe is luxated from the orbit, and eyelid spasms prevent its retraction. Secondary orbital hemorrhage and swelling displace the globe further from the orbit following corneo-conjunctival drying and malacia [3]. Prognosis depends on pupil size and reflexes, duration of exposure, other globe or orbital damage, breed and other systemic trauma. Approximately 40–60% of dogs, but very few cats, recover vision. Traumatic proptosis can occur in any breed and in both dogs and cats. Only 20-40% of dogs that have the reattachment of the eyeball regain their vision.

Case history and observations
A three year old male pug of 10 kg weight was presented at Jai Pet Care Clinic Raebareli, Utter Pradesh with unilateral traumatic proptosis having recent history of blunt head trauma by hitting head against the wall. Clinical examination revealed partial prolapse of right eye globe (fig.-1) through the pulpebral fissure with severe periorbital edema (fig.-2), haemorrhage without fracture of skull. There was absence of menace and presence of miosis. Corneal examination revealed concurrent finding of pigmentary vascular keratitis. All clinical parameters of the pug were normal.

Fig 1: Unilateral partial proptosed globe in a pug

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON LYMPHOCYTE PERCENT COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], Pramod Kumar[1] D. Niyogi[3] and M. Kumar[4]

[1]Department of Veterinary Physiology and Biochemistry, [3]Department of Veterinary Pathology, [4]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., [2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. Lymphocyte % in third and fourth month of experiment was significantly ($P<0.05$) lower in all groups (group-I to VII) in comparison to 0 day, first and second month. At fifth month, lymphocyte % was significantly ($P<0.05$) higher in group III, IV, VI and VII in composition to third and fourth month of experiment.

Keywords: Ewe, Photoperiod, Melatonin, Lymphocyte percent count

Introduction

Short days enhance immune function in individuals with robust reproductive responses to photoperiod. Total splenic lymphocyte number, and macrophage counts were significantly higher in hamsters exposed to short days, as compared to animals exposed to long photoperiods (Brainard *et al.*, 1988). Photoperiodic influences on lymphocyte number and total white blood cell count have been reported for deer mice (Blom *et al.*, 1994); short day (LD 8:16) mice possessed more white blood cells than animals maintained in long day lengths (LD 16:8). Importantly, all laboratory studies of photoperiodic effects on immune function have reported enhanced immune function in short day lengths (Nelson and Demas, 1996). Although many field studies support this hypothesis, with data suggesting enhanced immune function and decreased disease prevalence during the winter as compared to the summer, a substantial number of studies have reported the opposite pattern of results (Nelson and Demas, 1996); i.e., reduced immune function is coincident with the short days of winter. These conflicting results can be resolved by considering additional environmental factors, not usually manipulated in laboratory studies. For example, winter-associated stressors {e.g., restricted food and low ambient temperatures} appear to counteract short day enhancement of immune function in the lab.

Exogenous administration of melatonin increased the lymphocyte percentage in Broiler chicks (Abozahra *et al.*, 1998), Rats (Anwar *et al.*, 1998), and Squirrels (Rai *et al.*, 2009). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17:30 to 18:00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in lymphocyte percentage is not clear. However, several mechanisms may be involved in this respect. Haldar *et al.* (2006) accessed the effect of melatonin on immune parameters in a seasonally breeding animal, the Indian palm squirrel F. pennant and bird P. asiatica during reproductive phases in vivo as well as in vitro. Melatonin treated squirrels and birds showed an increase in percent lymphocyte count (% LC) and percent stimulation pinealectomy in squirrels. Melatonin administration recovered all the decreased immune parameters to the control level (Rai and Haldar, 2003). MEL supplementation also enhanced all immune parameters in both in vivo and in vitro, suggesting that the immune system was sensitive during the reproductively active phase to MEL when peripheral melatonin level was low and the role of melatonin could be important for the maintenance of the immune status of seasonal breeders.

As reported by Etim *et al.* (2014[a]) immune status is a function of leucocytes, lymphocytes and Neutrophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine Lymphocyte percent count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36°N latitude and 85.33°E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]:- The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]:- In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]:- Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period

HEAT STRESS INDICES, STANDARDS AND LIMITS WITH REFERENCE FOR CATTLE AND BUFFALOES

Pramod Kumar[1]*, Rishikant[2], Rabindra Kumar[3], Rajesh Kumar[3] Rajpal Diwakar[4] and Vibha Yadav[5]

[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229

[2] Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229

[3]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

[4&5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels would be a world first and, accordingly, no previous experience in the determination of acceptable heat stress limits, criteria or indices is wholly applicable. However, some tropical countries are already at beyond high temperature and much of the knowledge gained in managing and rearing of animal at such heat stress will be helpful in making adequate planning for acceptable environmental control at the greater thermal tress being contemplated. Accordingly, it is necessary to take cognisance of the dairy industry's experience in most tropical countries and of standards and regulations already established in South America and elsewhere in order to ensure acceptable conditions and control standards that compare favourably and defensibly with those in other dairy industries. Different countries uses of heat stress limits, criteria and indices were investigated as it was necessary to determine to what extent any other indices, limits or criteria would be applicable to tropical conditions. In addition, it was necessary to establish whether there was a single heat stress index that could be used in thermal stress for tropical climatic conditions. It was found that an appropriate combination of heat stress indices would be required in planning for and ultimately controlling thermal conditions in tropical climatic conditions. The solar radiations and humidity being contemplated and the concomitant potential heat hazard present too great a risk for reliance on environmental component of heat stress, such as wet-bulb temperature at present in common use locally. The study recommends that a heat stress index, preferably WBGT be used to design an modern dairy farm's ventilation system and that wet-bulb temperature be used to monitor and control the system once it is implemented.

Keywords: *Tropical, Heat stress limits, Indices, Dairy industry's, Convection, Solar Radiation, , WBGT Index.*

Introduction

Environmental conditions that is conducive to safe and productive for cattle and buffaloes. Although many aspects of a dairy farming environmental conditions would be much the same as those already prevailing in poultry, sheep, goat and other animal farming sector the variations in high metabolic energy requirement to which animal are exposed would increase by virtue of increased depth. The paper therefore offers some guidelines for the use of heat stress indices and limits as would be applicable for dairy farming.

Thermal conditions and the heat stress imposed on animal will be the most significant environmental consequences of dairy farming, indicating a need to quantify the effects of heat on animal health and their production performance. This represents a difference in purpose from the traditional concern with heat stress. The principal motivation in efforts to evaluate and control heat stress in the dairy farm has been to minimize its detrimental effects on animal. This has resulted in the development heat stress indices based same on physiological tolerance and production performance criteria. Given the critical impact that productivity will have on the success or failure of dairy farming criteria should form part of the fundamental basis for determining the thermal standards. In the past, a number of heat stress indices have been devised in attempts to combine various environment variables into a single number indicative of the heat stress imposed on cattle and buffaloes. Although such a number can provide some measure of environmental heat stress, there are many and varied criteria for evaluating the acceptability of thermal conditions for dairy farming.

Heat stress indices

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers.

The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$$

(Bianca, 1962),

$$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$$

(Bianca, 1962),

$$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$$

(Thom, 1959),

$$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$$

(National Research Council, 1971),

$$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$$

(National Research Council, 1971),

$$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$$

(National Research Council, 1971),

$$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$$

(Yousef, 1985a),

Black Globe Humidity Index:

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1076-1079

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1076-1079

Pramod Kumar
Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rishikant
Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rabindra Kumar
Department Of Veterinary Obst. & Gynae. C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

KN Singh
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Mukesh Kumar
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Correspondence
Pramod Kumar
Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

A review: heat stress in cow and buffaloes in India

Pramod Kumar, Rishikant, Rabindra Kumar, KN Singh and Mukesh Kumar

Abstract
India is a tropical climatic country in which heat stress is an important disadvantageous factor that reduces the production performance of cattle and buffalo and conduces to significant decrease in milk yields in dairy cows and buffalo and some metabolically disorders. The objective of this review is to known the heat stress metabolism, its causing factors and its preventative methods for increase the production performance through manage mental and nutritional procedures.

Keywords: Tropical, Heat, Temperature, Conduction, Convection, Radiation, Evaporation, Panting, Sweating, Moisture

Introduction

Climatic conditions of India are such that the hot and humid season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature especially for animal, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance of animal. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003) [20]. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Heat stress is caused by a combination of climatic factors like air temperature, humidity, solar radiation, wind velocity etc. A common time for experience adverse effects of high temperatures is during transport (Fiore *et al*, 2009) [6]. Transport is a multi affected stressor that can create or exacerbate existing heat loads. Handling of animal, increases body temperature. Animal are adversely affected any time the ambient temperature is more than their thermoneutral zone, which ranges about 25°C. Because that heat stress conduces to some disadvantageous affect on livestock, many researchers work about heat stress in animal.

Thermoneutral zone

The Thermoneutral Zone (TNZ) is defined as. "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non evaporative physical processes alone" (Bligh & Johnson, 1973) [3]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal (Silanikove, 2000) [14]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation or acclimatization, level of productivity, housing conditions, insulation, and behavior etc (Yousef, 1985b) [22]. In order to more clearly define the TNZ (Silanikove, 2000) [14] suggested that the subdivision of the TNZ into a zone of thermal well-being is most suitable to describe the relation between an animal and its environment. Figure 1, illustrate this concept.

SELECTING A SUITABLE HEAT STRESS INDEX TO PROTECT CATTLE AND BUFFALOES IN HOT AND HUMID CLIMATE

Pramod Kumar[1]*, R. C. Upadyay[2], P.K.Maurya[1], P.K. Chaudhary[1], Nilufar Haque[3], Rajesh Kumar[4], Rabindra Kumar[4] and R.P.Diwakar[5]

[1] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[2].HOD (Ret), Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana, 130001
[3] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., SDAU, Dantiwada, Gujarat-385506
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An assessment of any climate conditions requires extensive measurements to be health and production performance of animal in the climatic zone. This can be labour-intensive, time-consuming and consequently impractical for daily production and comfort assessments of the animals. Therefore, a simple indicator like a heat stress index is needed to enable a quick, valid and acceptable evaluation of animal climatic conditions on a regular basis. This can be explained by the unending quest to develop a "universal index," which has led to the proliferation of many proposed heat stress indices. In this research study is to discuss the selecting a suitable heat stress index for thermal planning and management purposes in hot and humid climatic zone for dairy industries. A method is proposed a defined strategy for selecting and recommending heat stress indices to be used in a particular climatic zone and worldwide based on a heat stress index. The performance of different heat stress indices used in dairy industries and other cattle farm varies based on the climatic conditions and the level of activities. Therefore, carefully selecting or establishing a suitable heat stress index is of paramount importance to ensure the comfort, health and increasing productivity of the cattle and buffaloes. These methods assess and select the most appropriate index for hot and humid climatic conditions to protect the cattle and buffaloes from thermal stress. Although complex, the method presents results that are easy to interpret and understand than any other methods.

Keywords: climatic zone, heat stress index, thermal stress, dairy industries.

Introduction

Heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy [1]. The ability of many indices using these elements have been developed in past; but their utility remained limited. Majority of studies on thermal stress in livestock have used temperature-humidity index (THI). THI represent the combined effect of air temperature and humidity with level of heat stress. Milk yield and DMI exhibited significant declines when maximum THI reached 77. Later research determined that the critical values for minimum, mean, and maximum THI were 64, 72 and 76 respectively [2]. In addition, a climate change scenario was constructed by raising both the minimum and maximum temperatures by 2.76°C, which is a mid-range temperature change for approximate doubling of atmospheric greenhouse gas concentrations. The incidence of stress days as measured by THI greater than 80 has increased significantly over the 40-year period (60%) and the climate change scenarios suggested further, substantial increases (138%) in the frequency of such heat stress days. In addition, in the climate change scenario there was a very marked increase in days where animals could no longer thermo regulate by sweating alone [3]. Different animal species have different sensitivities to air temperature, humidity, solar radiation and wind velocity etc. Cattle and buffaloes have differences in their heat tolerant capacity. Cattle can tolerate high temperatures at low air humidity than buffaloes. This is due to the fact that, cattle can dissipate heat more efficiently by surface evaporation whereas buffaloes use surface evaporation for body cooling to a limited extent.

This research study posed the question of which index can be recommended for a hot and humid climate? In this paper, a method is used to compare a thermal comfort model with some of the most widely used heat indices in dairy industries and another cattle farm. The method is applied to predict the "comfort zone" and to recommend an index based on its production performance as close as possible to the "comfort zone." The comparative analysis uses comfort data including air temperature, airflow velocity, humidity and estimated physiological parameters such as respiration rate and rectal temperature.

Cattle and buffaloes have capacity to maintain their body temperature with in a precise limit even after exposure of environmental extremes [4]. Animals gain heat from three sources: chemical, mechanical and thermal. Chemical and mechanical heat transfer relates to metabolic processes and represents the body's main heat sources. The influence of the thermal environment on an animal is primarily exerted through energy exchanges involving convection, conduction, radiation and evaporation [5]. There are mechanisms by which the body can regulate its core temperature both at rest and during activity, and in both hot and cold or humid environments, along with health risks that are associated with physical activity in the aforesaid environments [6]. Assessment of "Thermoneutral Zone" must start with the maximum production with wellbeing of animal. It is extremely difficult to classify the many factors that affect thermal comfort. The interaction between the physical demands imposed upon an animal his physiological status, and his psychological attitudes. Because thermal comfort is rather subjective and restrictive, it is better to define a Thermoneutral Zone within which most animals will be comfortable. This necessitates the need to define a "zone" in which most of the animals will consider comfortable, the so-called comfort zone. This comfort zone will be ascribed using the climatic and physiological parameters of the environment and some existing thermal comfort models.

The Thermoneutral Zone (TNZ) is defined as "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non-evaporative physical processes alone [7]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal [8]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation

The idea of the thermal index goes back to 18th century [9]. Without considering the dry-bulb temperature, perhaps the first published heat stress index was the wet-bulb temperature proposed by Haldane [10]. Since then a large number of heat stress indices have been proposed.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 281-285

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 281-285
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of α-Tocopherol Acetate and Zinc Supplementation on Milk Composition in Crossbred Cows

Pankaj Kumar Maurya[1*], Anjali Aggarwal[2], P. K. Choudhary[1], A. K. Verma[1] and Pramod Kumar[1]

[1]College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP), India
[2]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001, Haryana, India
**Corresponding author*

Keywords

Milk composition, Somatic cell count, Transition period, α-tocopherol acetate, Zinc

ABSTRACT

The study was conducted to investigate the effect of α-tocopherol acetate and zinc on milk composition in Karan Fries cows. Twenty pregnant Karan Fries cows were selected two months before expected date of calving. The experimental animals were randomly divided in to two groups namely control group (ten cows) and treatment group (ten cows). Treatment group cows were supplemented with α-tocopherol acetate @ 1000 IU/day/cow and zinc @ 60 ppm/day/cow. Milk fat % was lower in treatment group than control group but the overall fat in treatment group was found significantly higher than control group (4.47±0.20 vs. 3.95±0.27, P<0.01). The overall mean milk protein % was found 3.08±0.04 vs. 3.05±0.11, milk lactose % 4.47±0.08 vs. 4.48±0.10 and SNF % 8.17±0.15 vs. 8.15±0.17 in control group and treatment group, respectively which showed that there was no significant difference between the groups. The overall mean (±SEM) of somatic cell count of milk was found significantly lower (P<0.001) in treatment group than control group. The results of this study indicated that supplementations of antioxidants like α-tocopherol acetate and zinc have beneficial effects in improving quality of milk.

Introduction

For good quality dairy products there is need to know the quality aspects of milk produced. Since the diet is the fastest way to modify the milk production and quality in animals, even if the relations between the feeding and milk composition are quite complex. Trace elements, along with vitamins and minerals, are essential nutrients for cellular metabolism. They are critical components of almost every aspect of how a body grows, develops, functions and reproduces. Vitamin E is crucially involved in immune system function, such that supplementation with supranutritional levels of the vitamin E, results in improved immune responses and milk production (Chawla and Kaur, 2005; Baldi, 2005; Baldi *et al.*, 2008; Chandra and Aggarwal, 2009). There was significant decrease of somatic cell count (SCC) in milk at 15 days of lactation (0.29×10^6 vs. 0.86×10^6) in cows supplemented with 1000 IU vitamin E / day during dry period (Kaur *et al.*, 2002). The somatic cell count is internationally recognized as a parameter for assessing the milk quality and udder health. The present

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 292-298

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 292-298
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation and Comparison of Heat Stress Indices for Cattle and Buffaloes

Pramod Kumar[1*], R. C. Upadyay[2], Rabindra Kumar[3], P. K. Chaudhary[1], P. K. Maurya[1], Rajesh kumar[3], Vibha Yadav[4] and Mukesh Kumar[5]

[1]Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[2]Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana-130001, India
[3]Department of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[4]Department of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[5]Department of Veterinary Anatomy C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
**Corresponding author*

Keywords

Heat stress, Environmental variables, Heat stress indices, TGWB Index, THI

ABSTRACT

Cattle and buffaloes experience different level of stress during summer and hot humid conditions. However, the assessment of the heat stress and the translation of the heat stress in terms of physiological and psychological strain is complex. For over a century attempts have been made to construct an index, which will describe heat stress satisfactorily. The many indices that have been suggested can be categorized into two groups: "*physiological indices*" and "*environmental*", or "*direct indices*". The first groups are sophisticated indices, which are based on physiological variables; they are difficult to calculate and are not feasible for daily use. The latter group comprises of simple indices, which are based on the measurement of basic environmental variables. In this group many indices are in use for over four decades: the "temperature humidity index" (THI) and the "*TGWB Index*". The following research on heat stress indices and their comparison and evaluation to animal production and their performance. With the present knowledge it is suggested to adopt the TGWB Index under tropical conditions is recommended because globe temperature takes into accounts Tdb and solar radiant heat exchange and can help in finding stress level.

Introduction

In India during summer cattle and buffaloes are exposed to severe environmental heat stress, which may deteriorate productivity and performance of animals may even threaten to their survival. Thus, it is expected that the physiological heat strain experienced by an animal will be related to the total heat stress to which they are exposed, serving the need to maintain body-core temperature within a relatively narrow range of temperatures. Many attempts have been made to estimate the stress inflicted by a wide range of climate, or to estimate the corresponding physiological strain and to combine them into a single index—a heat stress index. The difficulties in creating a universal heat stress index are outlined in the present research and a simple way to

INTEGRATION BETWEEN THE THERMAL STRESS INDEX (TGWB) AND THE LIVESTOCK STRAIN INDEX (LSI) AS A GUIDELINE FOR DAIRY FARMING IN TROPICAL CLIMATE

Pramod Kumar[1]*, R.C.Upadhyay[2], P.K.Chaudhary[1], P. K. Maurya[1], Rishikant[3], Rabindra Kumar[4], Rajesh Kumar[4] and R. P. Diwaker[5] and Vibha Yadav[5]

[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[2]RL.HOD & Principal Scientist, Animal Physiology Division, ICAR-NDRI, Karnal-132001 (Hariyana)
[3] Department of Vety. Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP

Abstract

A new thermal stress index (TGWB Index), based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature suggests as a potential substitute for the temperature humidity index (THI) for cattle in tropical climate. This new stress index, found to have a high correlation to THI, is constructed from fast reading meteorological response sensors (Tdb, Twb, and Tg) that take only a few seconds to reach equilibrium. Furthermore, the TGWB Index is the first stress index using direct measurements of solar radiation and is calculated as follows:
TGWB Index = 0.78 (Tg + Twb) + 35.8
The recently suggested Livestock Strain Index (LSI) is capable of indicating physiological strain and analyzing milk production of cattle. The LSI is constructed from rectal temperature (Tre) and respiratory frequency rate (Rf) as follows:
$LSI = 5\ (Tre_{obs.} - Tre_{min.}).\ (Tre_{max.} - Tre_{min})^{-1} + 5\ (Rf_{obs.} - Rf_{min.}).\ (Rf_{max.} - Rf_{min})^{-1}$
Where Tre_{obs} and Rf_{obs} are the observed measurements Tre_{max} and Tre_{min}, and Rf_{max} and Rf_{min} are maximum and minimum simultaneous measurements taken at any time. The LSI is scaled from 0-10, whereby each variable LSI_{Tre} or LSI_{Rf} which represent the cardiovascular and the thermoregulation systems respectively. The purpose of this study was to develop guidelines based on TGWB Index and LSI for dairy cattle for combat to heat stress. In order to integrate LSI and TGWB Index, we decided to use both the LSI_{Rf} and LSI_{Tre} component, which represents the respiratory frequency rate and the strain reflected by the cardiovascular system. Furthermore, LSI_{Rf} and LSI_{Tre} are easier to measure, are easier to implement and simplifies the integration with TGWB Index. Concomitantly, it also categorizes the strain between 0-5, the higher the value, the higher the strain.

Key words: Tropical climate, Thermal stress, Indices, Solar Radiation, LSI, TGWB Index

Introduction

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$ (Bianca, 1962),

$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$ (Bianca, 1962),

$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$ (Thom, 1959),

$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$ (National Research Council, 1971),

$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$ (National Research Council, 1971),

$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$ (National Research Council, 1971),

$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$ (Yousef, 1985a),

The above indices have been used to calculate stress for each combination of environmental variables corresponding to the measurements made in the animals, in order to assure that each animal response was associated to a given environmental condition. The index THI1 is used to monitor discomfort of temperature and humidity in humans. The THI2 and THI7 have been empirically determined for cattle exposed to heat stress conditions in climatic chambers. How these indices from controlled environments relate to field conditions? With diurnal fluctuation of environmental variables remain unanswered (Bohmanova *et al.*, 2007). The index THI3 is used to monitor the degree of discomfort in humans. The THI5 represents cattle heat stress index, designed to indicate level of heat stress of outdoors cattle (West, 2003); and THI6 has been developed by the United State Weather Bureau to describe discomfort in humans.

THI values of 70 or less are considered comfortable, 75 to 78 stressful, and values greater than 78 because extreme distress and animals are unable to maintain normal body temperature (Silanikove, 2000). The THI fails to reflect the contributions of other environmental factors, such as airflow and thermal radiation.

As noted before, the index has gained immense popularity over the years. The temperature humidity index (THI) is in use in temperate climatic condition for cattle. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). It is important to note the correlation of temperature humidity index (THI) to physiological responses was only partially tested and was based mainly on the correlation between the number of heat stress cases of dairy animal and the heat load as calculated by the THI. I have inroduced my new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature as follows:

TGWB Index = 0.78 (Tg + Twb) + 35.8

This newly developed index was validated by using large databases and was found to be highly correlated to the temperature humidity index (THI). TGWB Index differs from other indices that have been suggested in the past for two main reasons. First, new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature, aside from using temperature

EFFECT OF A-TOCOPHEROL ACETATE AND ZINC SUPPLEMENTATION ON LEPTIN HORMONE DURING DRY PERIOD AND EARLY LACTATION IN CROSS BRED COWS

Pankaj Kumar Maurya*, Anjali Aggarwal[1], Pramod Kumar and P.K. Choudhary
College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP)
[1]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001 (Haryana)

Abstract

The study was conducted to investigate the effect of α-tocopherol acetate and zinc supplementation on Leptin Hormone during dry period and early lactation in cross bred cows. Twenty pregnant Karan Fries cows were selected on the basis of their body weight, BCS and parity, ten cows were kept in control group and other ten cows in treatment group which were supplemented with 1000 IU α-tocopherol acetate and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Leptin hormone. Body condition score of all the experimental animals was recorded on the day of blood collection. At parturition, BCS decreased significantly ($P<0.01$) in control group than treatment group. The plasma concentration of leptin was decreased at parturition and the level was significantly ($P<0.001$) higher in treatment group as compared to control group (3.66 vs. 2.55 ng/ml). Plasma NEFA was significantly ($P<0.001$) lower in treatment group as compared to control group. The results of this study indicated that supplementation of α-tocopherol acetate and zinc have beneficial effects in changing Leptin hormone level in this way that improves body condition and metabolic status of the animals.

Keywords: *Leptin, Body Condition Score, Energy Metabolites, α-tocopherol acetate, Zinc*

Introduction

Leptin is a 16 kDa protein hormone and it is synthesized by white adipose tissue. Leptin is involved in regulation of feed intake, energy balance, immunity and reproduction (Houseknecht *et al*., 2000; Ahima and Flier, 2003). After parturition, dairy cows suffer from an intense energy deficit caused by the onset of copious milk secretion and an inadequate increase in voluntary food intake which contributes to a decline in plasma leptin. This decline mirrors that of plasma insulin but is reciprocal to the profile of plasma growth hormone (GH), suggesting that both hormones may regulate plasma leptin in periparturient dairy cows (Block *et al*., 2001). Energy deficit of early lactation reduces leptin synthesis in white adipose tissue (WAT), and suggest roles for insulin, GH and metabolic fuels in mediating this effect of energy balance (Block *et al*., 2001). A concomitant suppression of immune functions and metabolic disorders during early lactation are related to decreased fertility (Butler and Smith, 1989). This may partly be due to decrease in blood concentrations of vitamins A & E and Zn (Meglia *et al*., 2001, Chandra, 2009). To meet the nutritional demands of milk synthesis during early lactation, dairy cows need to mobilize body reserves causing negative energy balance until nutrient intake covers the demands.

Material and methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). For the present study 20 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 10 cows kept in Control group and other 10 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of α-tocopherol acetate and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum over and above the normal feeding schedule at dairy farm of NDRI.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 3000 rpm at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Leptin hormone. Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Sample analysis

Blood sample was analyzed for plasma leptin and NEFA. Plasma Leptin was determined by "Bovine Leptin ELISA Quantitation kit" from Cusabio Biotech Co., Ltd. The copper soap solvent extraction method modified by Shipe et al. (1980) was adopted for the estimation of plasma NEFA.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software. The correlations among the various parameters were also calculated (Snedecor and Cochran, 1994).

Results and Discussion

Leptin

The mean±SE of plasma leptin concentration of control cows was 6.06±0.10 ng/ml 60 days before calving and on the day of calving it decreased to 2.55±0.31ng/ml. Further, in treatment group the plasma leptin concentration was 6.19±0.11ng/ml 60 days before calving and on the day of calving it decreased to 3.66±0.11ng/ml. In present study decrease in the plasma leptin concentration of control and treatment group cows was 57.92% and 40.87% respectively from 60 days before calving to the day of calving. This decrease was more significant ($P<0.01$) from 30 days before calving to the day of calving in control group than treatment group. After parturition it's level remained low up to 30 days then started increasing up to 60 days of lactation.

In present study there was found a positive correlation between leptin with BCS and insulin and a negative correlation was found between leptin with NEFA in control and treatment group of cows around parturition. The plasma concentration of leptin was positively correlated with plasma concentrations of insulin and negatively correlated with plasma concentrations of growth hormone, cortisol and non-esterified fatty acids (Block *et al*., 2001; Chelikani *et al*., 2008). Sauerwein *et al*. (2004) investigated that in ruminants the decline in plasma leptin levels towards parturition is probably caused by the decline in adiposity and insulin concentrations. In ruminants and other animals, leptin is synthesized in proportion to the overall degree of adiposity and acts on the central nervous system to reduce voluntary feed intake (Ehrhardt *et al*., 2000). Leptin, mainly produced in adipose tissue, inhibits feed intake and down-regulates adipose tissue deposition. Block *et al*. (2001) showed that leptin is negatively correlated with the amount of nonesterified fatty acids, which reflects the amount of fat mobilization. From early to mid pregnancy circulating leptin levels increased and remained elevated until late pregnancy in cattle (Liefers *et al*., 2003; Villalobos *et al*., 2007).

EFFECT OF A-TOCOPHEROL ACETATE AND ZINC SUPPLEMENTATION ON LEPTIN HORMONE DURING DRY PERIOD AND EARLY LACTATION IN CROSS BRED COWS

Pankaj Kumar Maurya*, Anjali Aggarwal[1], Pramod Kumar and P.K. Choudhary
College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP)
[1]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001 (Haryana)

Abstract

The study was conducted to investigate the effect of α-tocopherol acetate and zinc supplementation on Leptin Hormone during dry period and early lactation in cross bred cows. Twenty pregnant Karan Fries cows were selected on the basis of their body weight, BCS and parity, ten cows were kept in control group and other ten cows in treatment group which were supplemented with 1000 IU α-tocopherol acetate and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Leptin hormone. Body condition score of all the experimental animals was recorded on the day of blood collection. At parturition, BCS decreased significantly ($P<0.01$) in control group than treatment group. The plasma concentration of leptin was decreased at parturition and the level was significantly ($P<0.001$) higher in treatment group as compared to control group (3.66 vs. 2.55 ng/ml). Plasma NEFA was significantly ($P<0.001$) lower in treatment group as compared to control group. The results of this study indicated that supplementation of α-tocopherol acetate and zinc have beneficial effects in changing Leptin hormone level in this way that improves body condition and metabolic status of the animals.

Keywords: *Leptin, Body Condition Score, Energy Metabolites, α-tocopherol acetate, Zinc*

Introduction

Leptin is a 16 kDa protein hormone and it is synthesized by white adipose tissue. Leptin is involved in regulation of feed intake, energy balance, immunity and reproduction (Houseknecht *et al*., 2000; Ahima and Flier, 2003). After parturition, dairy cows suffer from an intense energy deficit caused by the onset of copious milk secretion and an inadequate increase in voluntary food intake which contributes to a decline in plasma leptin. This decline mirrors that of plasma insulin but is reciprocal to the profile of plasma growth hormone (GH), suggesting that both hormones may regulate plasma leptin in periparturient dairy cows (Block *et al*., 2001). Energy deficit of early lactation reduces leptin synthesis in white adipose tissue (WAT), and suggest roles for insulin, GH and metabolic fuels in mediating this effect of energy balance (Block *et al*., 2001). A concomitant suppression of immune functions and metabolic disorders during early lactation are related to decreased fertility (Butler and Smith, 1989). This may partly be due to decrease in blood concentrations of vitamins A & E and Zn (Meglia *et al*., 2001, Chandra, 2009). To meet the nutritional demands of milk synthesis during early lactation, dairy cows need to mobilize body reserves causing negative energy balance until nutrient intake covers the demands.

Material and methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). For the present study 20 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 10 cows kept in Control group and other 10 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of α-tocopherol acetate and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum over and above the normal feeding schedule at dairy farm of NDRI.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 3000 rpm at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Leptin hormone. Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Sample analysis

Blood sample was analyzed for plasma leptin and NEFA. Plasma Leptin was determined by "Bovine Leptin ELISA Quantitation kit" from Cusabio Biotech Co., Ltd. The copper soap solvent extraction method modified by Shipe et al. (1980) was adopted for the estimation of plasma NEFA.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software. The correlations among the various parameters were also calculated (Snedecor and Cochran, 1994).

Results and Discussion

Leptin

The mean±SE of plasma leptin concentration of control cows was 6.06±0.10 ng/ml 60 days before calving and on the day of calving it decreased to 2.55±0.31ng/ml. Further, in treatment group the plasma leptin concentration was 6.19±0.11ng/ml 60 days before calving and on the day of calving it decreased to 3.66±0.11ng/ml. In present study decrease in the plasma leptin concentration of control and treatment group cows was 57.92% and 40.87% respectively from 60 days before calving to the day of calving. This decrease was more significant ($P<0.01$) from 30 days before calving to the day of calving in control group than treatment group. After parturition it's level remained low up to 30 days then started increasing up to 60 days of lactation.

In present study there was found a positive correlation between leptin with BCS and insulin and a negative correlation was found between leptin with NEFA in control and treatment group of cows around parturition. The plasma concentration of leptin was positively correlated with plasma concentrations of insulin and negatively correlated with plasma concentrations of growth hormone, cortisol and non-esterified fatty acids (Block *et al*., 2001; Chelikani *et al*., 2008). Sauerwein *et al*. (2004) investigated that in ruminants the decline in plasma leptin levels towards parturition is probably caused by the decline in adiposity and insulin concentrations. In ruminants and other animals, leptin is synthesized in proportion to the overall degree of adiposity and acts on the central nervous system to reduce voluntary feed intake (Ehrhardt *et al*., 2000). Leptin, mainly produced in adipose tissue, inhibits feed intake and down-regulates adipose tissue deposition. Block *et al*. (2001) showed that leptin is negatively correlated with the amount of nonesterified fatty acids, which reflects the amount of fat mobilization. From early to mid pregnancy circulating leptin levels increased and remained elevated until late pregnancy in cattle (Liefers *et al*., 2003; Villalobos *et al*., 2007).

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-IV) : 2668-2670 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

STATISTICAL MODEL APPROACHES TO ASSESS THE EXTENT OF HEAT STRESS IN CATTLE

Pramod Kumar[1], R.C. Upadyay[2], Rabindra Kumar[3], Rajesh Kumar[3] and Vibha Yadav[4]

[1]*Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229*
[2]*Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana, 130001*
[3]*Department of Veterinary Obs. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229*
[4]*Department of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229*
E-mail : pihu012013@gmail.com Mobile no. 9452725105

ABSTRACT

In the Changing global scenario, exploding world population, limited natural recourses and environmental degradation are posing a greatest challenge to the sustainable production and reproduction of livestock for human population. Climate change has profound effect on livestock. The anticipated rise in temperature due to climate change is likely to aggravate the heat stress in livestock, adversely affecting their productive and reproductive performance. Heat is the major constraint in tropical and sub tropical climatic conditions which negatively affects production and reproduction of livestock species. Cattle and buffaloes experience different level of stress during summer and hot humid conditions. Climatic conditions in the India are such that the warm (or hot) season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depresses the performance. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines. Temperature-Humidity Index (THI) available with different temperature and humidity weightage are suitable for different specific areas.

Key words : *Global Scenario, Climate change, Livestock, challenges, Heat stress index, THI.*

One of the greatest challenges to production from lactating dairy cattle and buffaloes facing dairy farmers in the India is heat stress. Climatic conditions in the India are such that the warm (or hot) season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003). Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Rectal Temperature : A change in rectal temperature has been considered an index of heat stored in large animals and other mammals. For well-hydrated beef cattle living in temperate climates, the range of normal rectal temperature is 36.7 to 39.1°C (Cunningham, 2002).

Normal rectal temperature in Indian cattle has been reported to be 38.3 ± 0.3°C by Mullick (1961) and Bhattacharya et al., (1965). For zebu cattle and crossbred bullocks, normal rectal temperature was reported to be 38.3 and 38.4°C, respectively (Upadhyay, 1982). Heat inputs cannot be equal to heat outputs at all times; therefore, the maintenance of body temperature within this range is achieved through a system of temperature regulation. To regulate body temperature the animal have a variety of temperature sensors located within the body. There are specific temperatures sensitive neuronal structures located in the skin and in the mucous surfaces of the buccal cavity, in regions of the spinal cord, and in the hypothalamus of the midbrain (Bligh, 1985). These sensors relay information to the pre-optic area of the hypothalamus, which is thought to be the main centre for temperature regulation. The pre-optic area of the hypothalamus then initiates mechanisms to either increase or decrease heat loss or production (Cunningham, 2002). In the regulation of body temperature, the hypothalamus behaves as if it has a normal "set-point". When rectal temperature rises above or falls below the set point, heat losing, or heat gaining mechanisms are initiated (Cunningham. 2002).

Respiration Rate : The other method of evaporative heat loss available in cattle is via respiration. Respiration rate (RR) has long served as a gross indicator of heat during hot weather, increasing when animals need to maintain homoeothermy by dissipating excess heat stress as other avenues become inadequate (Hahn. 1999). The normal

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA I MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON TOTAL LEUCOCYTE COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], P. Kumar[1] D. Niyogi[3] and M. Kumar[4]

[1]Department of Veterinary Physiology and Biochemistry, [3]Department of Veterinary Pathology, [4]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumarganj, Faizabad, U.P., [2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi.

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. TLC at first month was significantly ($P<0.05$) higher in all short day groups (V, VI and VII) and significantly ($p<0.05$) lower in long day groups (II, III and IV) in comparison to 0 day. After administration of melatonin, TLC was significantly ($p<0.05$) higher in group III, IV, VI and VII in comparison to first month. At third and fourth month TLC was significantly ($P<0.05$) low in group VI and VII in comparison to second month.

Keywords: Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Total leucocyte count

Introduction

Melatonin signaling is necessary for photoperiodic adjustment in immune responses; it is difficult to parse the differential direct effects of melatonin on immune cells from indirect modulatory actions on other neuro-endocrine axes including the systems that control gonadal and adrenal steroids. However, the hypothesis that melatonin acts on immune function via down- stream hormonal effects has not been born out, as gonadectomy and steroid replacement has minimal effect on photoperiodic plasticity in immune system (Prendergast *et al*., 2005). Further, although androgens tend to be immunosuppressive estrogens often have the opposite effect (Klein, 2008). Therefore, the short-day induced gonadal regression would likely induce opposite effects in males and females if sex steroids were directly responsible for photoperiodic adjustments in immune responses. In general, both males and females respond similarly to changes in day length (Bilbo and Nelson, 2003). Gonadal steroids probably serve to modulate the larger melatonin-mediated effects of day length rather than directly driving photoperiodic changes (Prendergast *et al*., 2008).

Exogenous administration of melatonin increased the total leucocytic count and lymphocyte percentage in Broiler chicks (Abozahra *et al*., 1998), Rats (Anwar *et al*., 1998), and Squirrels (Rai *et al*., 2009). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17:30 to 18:00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease total leucocyte count and percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in total leucocytic count and lymphocyte percentage is not clear. However, several mechanisms may be involved in this respect.

The major functions of the white blood cells and its differentials are to fight infections, defend the body by phagocytosis against invasion by foreign organisms and to produce or at least transport and distribute antibodies in immune response (Etim, 2015). Thus, animals with low white blood cells are exposed to high risk of disease infection. While those with high counts are capable of generating antibodies in the process of phagocytosis and have high degree of resistance to disease and enhancing adaptability to local environment and disease prevalent conditions (Isaac *et al*., 2013). As reported by Etim *et al*. (2014[a]) immune status is a function of leucocytes, lymphocytes and Neutrophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine total leucocyte count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36^{0}N latitude and 85.33^{0}E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty-two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]: - The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]: - In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)]: - In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]: - Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]: - Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]: - Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Rams were introduced into each group after completion of exogenous administration of melatonin. Blood samples were collected from each animal day before the start of experiment and there after every month up to fifth month. Blood (0.5ml) was collected from each animal in clean EDTA coated tubes and Total Leucocytes Count (x 10^{3}/µl blood) was counted as per

The Pharma Innovation Journal 2022; SP-11(5): 1529-1531

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(5): 1529-1531
© 2022 TPI
www.thepharmajournal.com
Received: 06-02-2022
Accepted: 12-03-2022

SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Basant Singh
Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India

RK Sharma
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

DV Singh
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

J Palod
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author
SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of refind sunflower oil on weight loss and internal quality characteristics of white leghorn hen eggs at room and refrigeration temperatures

SS Chauhan, Basant Singh, RK Sharma, DV Singh and J Palod

Abstract
The 164 Infertile Eggs of White Leghorn were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The birds were maintained on similar feed and environmental conditions. The 164 eggs were divided in four groups, each comprising of 41 eggs. These groups were categorized into two groups and were kept at room temperature and remaining two was kept in refrigerator. The weight and internal quality of egg as Albumen Index, Yolk Index, Haugh Unit were recorded. The experiment was designed in simple randomized block with Four treatments and two temperatures. The result showed that the weight loss of egg and yolk index, were differ significantly in comparison to control while Haugh Unit at room temperature and Albumen Index did not differ significantly at room and refrigeration temperature. Refind Sunflower Oil prolonged the shelf-life of eggs to 28 and 75 days under room and refrigeration temperature while in control it was 14 days and 60 days under room and refrigeration condition.

Keywords: Yolk index, albumen index, Haugh unit

Introduction
Poultry production has emerged as an important and fastest growing sector of our livestock economy. Poultry farming has become very encouraging enterprise in modern India for small farmers, landless labours, educated un-employed youths as well as for big entrepreneurs. The gap between availability and the requirement shows a huge scope for further growth and development of poultry industry in India Egg is a rich source of high quality animal protein and is often used as standard for measuring the quality of the other food proteins. It is an important source of unsaturated fatty acid, minerals especially iron and phosphorus and almost all the vitamins. It is well balanced amino acid profile and easy digestibility makes it a valuable protective food in human diet. Egg is the wholesome food of animal origin, which cannot be adulterated by any human means till, is reaches to ultimate consumer in original form. It is the only source of high quality proteinous food and is very useful to fight malnutrition in India. Egg being very useful in human diet requires proper preservation to ensure its accept abilities for a longer period. Eggs are highly perishable commodity and need fast movement from the point of production to the point of consumption, particularly during summer months. It starts deteriorating from the moment it is laid. Research indicated that one out of every four egg produced in India did not reach to the consumer in good conditions. Oil coating is one of the most important methods for preserving eggs. The oil seals the pores of the shell which prevents the evaporation of moisture, entry of microorganism, odours and escape of gases. This checks the weight loss of egg and maintains the good internal quality for longer period because some of the physiochemical changes in the egg contents are being retarded. Keeping aforesaid points in view, the present investigation on Refined Sunflower Oil was undertaken with following objectives: To evaluate the changes in the internal quality and weight loss in oil coated and uncoated eggs held at room and refrigeration temperatures.

Materials and Methods
A total of 164 freshly laid, infertile eggs of a single strain of White Leghorn of same age and reared in cages under identical condition of feeding and management were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The eggs of almost similar and weight were selected for study. The candling was done at the time of procurement and before the start of experiment for selecting the sound egg. These 164 eggs were divided in four

The Pharma Innovation Journal 2022; SP-11(5): 1529-1531

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(5): 1529-1531
© 2022 TPI
www.thepharmajournal.com
Received: 06-02-2022
Accepted: 12-03-2022

SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Basant Singh
Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India

RK Sharma
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

DV Singh
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

J Palod
Department of Livestock Production, Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author
SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of refind sunflower oil on weight loss and internal quality characteristics of white leghorn hen eggs at room and refrigeration temperatures

SS Chauhan, Basant Singh, RK Sharma, DV Singh and J Palod

Abstract
The 164 Infertile Eggs of White Leghorn were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The birds were maintained on similar feed and environmental conditions. The 164 eggs were divided in four groups, each comprising of 41 eggs. These groups were categorized into two groups and were kept at room temperature and remaining two was kept in refrigerator. The weight and internal quality of egg as Albumen Index, Yolk Index, Haugh Unit were recorded. The experiment was designed in simple randomized block with Four treatments and two temperatures. The result showed that the weight loss of egg and yolk index, were differ significantly in comparison to control while Haugh Unit at room temperature and Albumen Index did not differ significantly at room and refrigeration temperature. Refind Sunflower Oil prolonged the shelf-life of eggs to 28 and 75 days under room and refrigeration temperature while in control it was 14 days and 60 days under room and refrigeration condition.

Keywords: Yolk index, albumen index, Haugh unit

Introduction
Poultry production has emerged as an important and fastest growing sector of our livestock economy. Poultry farming has become very encouraging enterprise in modern India for small farmers, landless labours, educated un-employed youths as well as for big entrepreneurs. The gap between availability and the requirement shows a huge scope for further growth and development of poultry industry in India Egg is a rich source of high quality animal protein and is often used as standard for measuring the quality of the other food proteins. It is an important source of unsaturated fatty acid, minerals especially iron and phosphorus and almost all the vitamins. It is well balanced amino acid profile and easy digestibility makes it a valuable protective food in human diet. Egg is the wholesome food of animal origin, which cannot be adulterated by any human means till, is reaches to ultimate consumer in original form. It is the only source of high quality proteinous food and is very useful to fight malnutrition in India. Egg being very useful in human diet requires proper preservation to ensure its accept abilities for a longer period. Eggs are highly perishable commodity and need fast movement from the point of production to the point of consumption, particularly during summer months. It starts deteriorating from the moment it is laid. Research indicated that one out of every four egg produced in India did not reach to the consumer in good conditions. Oil coating is one of the most important methods for preserving eggs. The oil seals the pores of the shell which prevents the evaporation of moisture, entry of microorganism, odours and escape of gases. This checks the weight loss of egg and maintains the good internal quality for longer period because some of the physiochemical changes in the egg contents are being retarded. Keeping aforesaid points in view, the present investigation on Refined Sunflower Oil was undertaken with following objectives: To evaluate the changes in the internal quality and weight loss in oil coated and uncoated eggs held at room and refrigeration temperatures.

Materials and Methods
A total of 164 freshly laid, infertile eggs of a single strain of White Leghorn of same age and reared in cages under identical condition of feeding and management were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The eggs of almost similar and weight were selected for study. The candling was done at the time of procurement and before the start of experiment for selecting the sound egg. These 164 eggs were divided in four

B-4122
[1-4]

RESEARCH ARTICLE Indian Journal of Animal Research, Volume Issue: ()

Modulation of Performance Index, Glucose and Cholesterol Level in Broiler Chickens Fed Diets Containing Different Supplements

S.S. Chauhan[1, 2], R.K. Sharma[3], A. Kumar[1], S.K. Shukla[3], J. Palod[1], M.K. Singh[1, *], 10.18805/IJAR.B-4122

ABSTRACT

Background: The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the performance index, glucose and serum cholesterol for 6 weeks.

Methods: Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups, each with 3 replicates. The first treatment was designated as control (T_0) in which no supplement was added to the feed, while in treatments T_1: organic mineral mixture (Organomin forte), T_2: organic mineral mixture (Vannamin), T_3: probiotics (Microguard), T_4: enzyme (Biozyme -XPR) and probiotics, T_5: emulsifier (Lipigon) were provided through feed. In the T_6 group, 3 percent less energy was given through feed.

Result: Significant improvement ($p<0.05$) was observed in performance index and HDL cholesterol and significant ($P<0.05$) decline in the glucose, total cholesterol, LDL cholesterol and triglyceride in broilers under supplementary groups as compared to control groups. The results of the present study indicated that it is possible to produce lean meat to an extent by manipulating diets which lead to better performance index of broilers during the overall period, which led to the release of more nutrients which helped in absorption, assimilation and utilization.

Key words: Broiler, Cholesterol, Lean meat, Performance index, Supplements.

INTRODUCTION

Poultry production in India has taken a quantum leap in the last six decades, emerging from an entirely unorganized and unscientific farming practice to a commercial production system with state-of-the-art technological interventions (Singh *et al*., 2017).

Corn and soybean meal are two major ingredients in commercial poultry diets in many parts of the world which contain a lower concentration of antinutritive high molecular weight-soluble nonstarch polysaccharides (NSP) that can impede normal digestion and absorption processes of nutrients including carbohydrates and proteins in the digestive tract by Govil *et al.* (2017). About 400-450 kcal of energy per kg of diet is not digested when birds are fed a typical corn-soy ration by Cowieson (2010).

The use of organic mineral mixtures improves performance, activates immune stimulation, optimizes minerals absorption and utilization and improves oxidative status in broiler chicks (Ravindran 2013).

Probiotic (Microguard) on administration passes through stomach reaches intestine where it colonizes occupying the intestinal villi and prevents pathogens from attaching to the intestine and at the same time favors the growth of favorable and essential microflora in the gut. They also produce substances like bacteriocins and local acting antibiotics that are antagonistic to pathogens. It also secretes enzymes like protease, amylase and lipase along with other nutrients and supplements which can be used by the lactic acid-producing and other useful bacteria to multiply rapidly and to sustain them for a longer time in the intestine. Further prevents clostridial and salmonella infections and reinforces the integrity of the gut wall and stimulates intestinal immunity-enhancing production of secretory antibodies.

[1]Department of Livestock Production Management (LPM), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A&T), Pantnagar-263 145, Uttarakhand, India.
[2]Department of Livestock Production Management (LPM), NDUA&T, Ayodhya-224 229, Uttar Pradesh, India.
[3]Department of Veterinary Medicine (VMD), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A and T), Pantnagar-263 145, Uttarakhand, India.
[4]Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281 001, Uttar Pradesh, India.

Corresponding Author: M.K. Singh, Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281001, Uttar Pradesh, India.
Email: drmksingh_1@rediffmail.com

How to cite this article: Chauhan, S.S., Sharma, R.K., Kumar, A., Shukla, S.K., Palod, J. and Singh, M.K. (2020). Modulation of Performance Index, Glucose and Cholesterol Level in Broiler Chickens Fed Diets Containing Different Supplements. Indian Journal of Animal Research. 10.18805/IJAR.B-4122

Submitted: 16-03-2020 **Accepted:** 23-10-2020 **Online:** 29-12-2020

The Pharma Innovation Journal 2022; SP-11(5): 1484-1487

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(5): 1484-1487
© 2022 TPI
www.thepharmajournal.com
Received: 19-03-2022
Accepted: 26-05-2022

SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Basant Singh
Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India

RK Sharma
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

DV Singh
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

J Palod
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

Corresponding Author
SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of refined mustard oil on weight loss and internal quality characteristics of white leghorn hen eggs at room and refrigeration temperatures

SS Chauhan, Basant Singh, RK Sharma, DV Singh and J Palod

Abstract
The 164 Infertile Eggs of White Leghorn were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The birds were maintained on similar feed and environmental conditions. The 164 eggs were divided in four groups, each comprising of 41 eggs. These groups were categorized into two groups and were kept at room temperature and remaining two was kept in refrigerator. The weight and internal quality of egg as Albumen Index, Yolk Index, Haugh Unit were recorded. The experiment was designed in simple randomized block with Four treatments and two temperatures. The result showed that the weight loss of egg and yolk index, were differ significantly in comparison to control while Haugh Unit at room temperature and Albumen Index did not differ significantly at room and refrigeration temperature. Refined Mustard Oil treated eggs prolonged the shelf-life of eggs to 28 and 75 days under room and refrigeration temperature while in control it was 14 days and 60 days under room and refrigeration condition.

Keywords: Yolk index, albumen index, Haugh unit

Introduction
Poultry production has emerged as an important and fastest growing sector of our livestock economy. Poultry farming has become very encouraging enterprise in modern India for small farmers, landless labours, educated un-employed youths as well as for big entrepreneurs. The gap between availability and the requirement shows a huge scope for further growth and development of poultry industry in India Egg is a rich source of high quality animal protein and is often used as standard for measuring the quality of the other food proteins. It is an important source of unsaturated fatty acid, minerals especially iron and phosphorus and almost all the vitamins. It is well balanced amino acid profile and easy digestibility makes it a valuable protective food in human diet. Egg is the wholesome food of animal origin, which cannot be adulterated by any human means till is reaches to ultimate consumer in original form. It is the only source of high quality proteinous food and is very useful to fight malnutrition in India. Egg being very useful in human diet requires proper preservation to ensure its acceptability for a longer period. Eggs are highly perishable commodity and need fast movement from the point of production to the point of consumption, particularly during summer months. It starts deteriorating from the moment it is laid. Research indicated that one out of every four egg produced in India did not reach to the consumer in good conditions. Oil coating is one of the most important methods for preserving eggs. The oil seals the pores of the shell which prevents the evaporation of moisture, entry of microorganism, odours and escape of gases. This checks the weight loss of egg and maintains the good internal quality for longer period because some of the physiochemical changes in the egg contents are being retarded. Keeping aforesaid points in view, the present investigation on Refined Mustard oil was undertaken with following objectives: To evaluate the changes in the internal quality and weight loss in oil coated and uncoated eggs held at room and refrigeration temperatures.

Materials and Methods
A total of 164 freshly laid, infertile eggs of a single strain of White Leghorn of same age and reared in cages under identical condition of feeding and management were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The eggs of almost similar and weight were selected for study. The candling was done at the time of procurement and before the start of experiment for selecting the sound egg.

RESEARCH ARTICLE Indian Journal of Animal Research, Volume 55 Issue 2: 189-192 (February 2021)

Studies on Serum Mineral Profile and Kidney Function of Broiler Chickens Fed Diets Containing Different Supplements

S.S. Chauhan[1], R.K. Sharma[1], D.V. Singh[1], S.K. Shukla[2], J. Palod[3], M.K. Singh[3]

10.18805/ijar.B-3934

ABSTRACT

The aim of the study was to investigate the effects of various feed supplements on minerals status and kidney health of broiler chickens. Two hundred fifty two, day-old Cobb-400 broiler chicks were randomly distributed into seven groups with 3 replicates of 12 chicks each. The first treatment was designated as control (T_0) in which no supplement was added to the feed, while in treatments T_1: organic mineral mixture (Organomin forte), T_2: organic mineral mixture (Vannamin), T_3: probiotics (Microguard), T_4: enzyme (Biozyme -XPR) and probiotics, T_5: emulsifier (Lipigon) were provided through feed. In T_6 group, 3 per cent less energy was given through feed. The serum calcium levels were significantly (P<0.05) increased in supplemented groups as compared to T_0 (control) group in both the periods while phosphorus values were significantly (P<0.05) increased in supplemented groups during starter period. Urea, Uric acid, BUN and creatinine values were significantly (P<0.05) decreased in supplemented groups as compared to T_6 group in both the periods. B/C ratios were significantly (P<0.05) decreased in all supplemented groups except T_3 and T_4 in both the periods. Therefore, it could be concluded that dietary supplementation maintained the mineral homeostasis and did not have adverse effect on kidney function.

Key words: Broiler chicks, Kidney function, Mineral profile, Supplements.

INTRODUCTION

The Indian broiler farmers rely on the commercial feeds produced by feed mill industries. In general, commercial broiler feeds have been formulated to meet the nutritional requirements of the birds. In some cases, the bad feed handling on the farm such as prolonged storage or inadequate storage conditions may, however, impair the nutritional qual-ities of the feeds. Such condition may cause specific micronutrient deficiencies, especially minerals, leading to growth retardation in broilers (Aviagen, 2014). To optimize the growth potential of modern broilers in the commercial farms, the commercial broiler feeds are generally supplemented with organic mineral mixtures, probiotics, enzymes and emulsifiers.

Increased level of creatinine in serum can be indicative of kidney damage (Yalcin *et al.*, 2012). Certain probiotic microorganisms have the ability to use urea, creatinine and other toxic chemicals as its nutrients for growth (Salim *et al.*, 2011). Therefore, relatively low level creatinine may be an indication of the renal protective effects of the probiotic microorganism.

Hence, it would be interesting to investigate the effect of such dietary treatment on the performances and physiolog-ical responses of broiler chickens. Taken together, the present study aimed to investigate the effect of supplementation of various dietary supplements and their combination on their mineral homeostasis and kidney functions.

MATERIALS AND METHODS

Experimental birds and dietary treatments

The present study was undertaken at the Instructional Poultry Farm (IPF) of Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, U.S. Nagar. A total of 252, day old commercial broiler chicks (Cobb) were procured for conducting the experiment. All the chicks were individually weighed and randomly allotted to seven different groups each with three replicates of 12 chicks. Average body weight of chicks was similar for all the treatment groups. The study was conducted for a period of 6 weeks under standard management conditions. Feed and water were provided ad *libitum*. The detail of experimental diets is given in Table 1.

Serum analysis

Blood samples (2 ml) were taken from the wing vein of 6 fasting broilers per treatment groups on 21st and 42th day of experiment. Serum was obtained by centrifugation of blood at 3000 rpm for 10 min, and then it was frozen at -20°C for future analysis. Serum sodium (Na) and potassium (K) were

[1]Department of Livestock Production Management, G.B.P.U.A and T., Pantnagar-263 145, Uttarakhand, India.
[2]Department of Veterinary Medicine, G.B.P.U.A and T., Pantnagar-263 145, Uttarakhand, India.
[3]Department of Poultry Science, DUVASU, Mathura-281 001, Uttar Pradesh, India.

Corresponding Author: M.K. Singh, Department of Poultry Science, DUVASU, Mathura-281 001, Uttar Pradesh, India. Email: drmksingh_1@rediffmail.com

How to cite this article: Chauhan, S.S., Sharma, R.K., Singh, D.V., Shukla, S.K., Palod, J. and Singh, M.K. (2021). Studies on Serum Mineral Profile and Kidney Function of Broiler Chickens Fed Diets Containing Different Supplements. Indian Journal of Animal Research. 55(2): 189-192. DOI: 10.18805/ijar.B-3934.

Submitted: 05-10-2019 **Accepted:** 25-12-2019 **Online:** 15-04-2020

B-4122
[1-4]

RESEARCH ARTICLE Indian Journal of Animal Research, Volume Issue : ()

Modulation of Performance Index, Glucose and Cholesterol Level in Broiler Chickens Fed Diets Containing Different Supplements

S.S. Chauhan[1, 2], R.K. Sharma[1], A. Kumar[1], S.K. Shukla[3], J. Palod[1], M.K. Singh[1, 4], 10.18805/IJAR.B-4122

ABSTRACT

Background: The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the performance index, glucose and serum cholesterol for 6 weeks.

Methods: Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups, each with 3 replicates. The first treatment was designated as control (T_1) in which no supplement was added to the feed, while in treatments T_2: organic mineral mixture (Organomin forte), T_3: organic mineral mixture (Vannamin), T_4: probiotics (Microguard), T_5: enzyme (Biozyme -XPR) and probiotics, T_6: emulsifier (Lipigon) were provided through feed. In the T_6 group, 3 percent less energy was given through feed.

Result: Significant improvement ($p<0.05$) was observed in performance index and HDL cholesterol and significant ($P<0.05$) decline in the glucose, total cholesterol, LDL cholesterol and triglyceride in broilers under supplementary groups as compared to control groups. The results of the present study indicated that it is possible to produce lean meat to an extent by manipulating diets which lead to better performance index of broilers during the overall period, which led to the release of more nutrients which helped in absorption, assimilation and utilization.

Key words: Broiler, Cholesterol, Lean meat, Performance index, Supplements.

INTRODUCTION

Poultry production in India has taken a quantum leap in the last six decades, emerging from an entirely unorganized and unscientific farming practice to a commercial production system with state-of-the-art technological interventions (Singh *et al.*, 2017).

Corn and soybean meal are two major ingredients in commercial poultry diets in many parts of the world which contain a lower concentration of antinutritive high molecular weight-soluble nonstarch polysaccharides (NSP) that can impede normal digestion and absorption processes of nutrients including carbohydrates and proteins in the digestive tract by Govil *et al.* (2017). About 400-450 kcal of energy per kg of diet is not digested when birds are fed a typical corn-soy ration by Cowieson (2010).

The use of organic mineral mixtures improves performance, activates immune stimulation, optimizes minerals absorption and utilization and improves oxidative status in broiler chicks (Ravindran 2013).

Probiotic (Microguard) on administration passes through stomach reaches intestine where it colonizes occupying the intestinal villi and prevents pathogens from attaching to the intestine and at the same time favors the growth of favorable and essential microflora in the gut. They also produce substances like bacteriocins and local acting antibiotics that are antagonistic to pathogens. It also secretes enzymes like protease, amylase and lipase along with other nutrients and supplements which can be used by the lactic acid-producing and other useful bacteria to multiply rapidly and to sustain them for a longer time in the intestine. Further prevents clostridial and salmonella infections and reinforces the integrity of the gut wall and stimulates intestinal immunity-enhancing production of secretory antibodies.

[1]Department of Livestock Production Management (LPM), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A.andT), Pantnagar-263 145, Uttarakhand, India.

[2]Department of Livestock Production Management (LPM), NDUAand T, Ayodhya-224 229, Uttar Pradesh, India.

[3]Department of Veterinary Medicine (VMD), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A and T), Pantnagar-263 145, Uttarakhand, India.

[4]Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281 001, Uttar Pradesh, India.

Corresponding Author: M.K. Singh, Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281001, Uttar Pradesh, India.
Email: drmksingh_1@rediffmail.com

How to cite this article: Chauhan, S.S., Sharma, R.K., Kumar, A., Shukla, S.K., Palod, J. and Singh, M.K. (2020). Modulation of Performance Index, Glucose and Cholesterol Level in Broiler Chickens Fed Diets Containing Different Supplements. Indian Journal of Animal Research. 10.18805/IJAR.B-4122

Submitted: 16-03-2020 **Accepted:** 23-10-2020 **Online:** 29-12-2020

The Pharma Innovation Journal 2022; SP-11(5): 1484-1487

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(5): 1484-1487
© 2022 TPI
www.thepharmajournal.com
Received: 19-03-2022
Accepted: 26-05-2022

SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Basant Singh
Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, India

RK Sharma
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

DV Singh
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

J Palod
Department of Livestock Production Management, C.V&AS, GBPUAT, Pantnagar, Uttarakhand- India

Corresponding Author
SS Chauhan
Department of Livestock Production Management, C.V.Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of refined mustard oil on weight loss and internal quality characteristics of white leghorn hen eggs at room and refrigeration temperatures

SS Chauhan, Basant Singh, RK Sharma, DV Singh and J Palod

Abstract
The 164 Infertile Eggs of White Leghorn were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The birds were maintained on similar feed and environmental conditions. The 164 eggs were divided in four groups, each comprising of 41 eggs. These groups were categorized into two groups and were kept at room temperature and remaining two was kept in refrigerator. The weight and internal quality of egg as Albumen Index, Yolk Index, Haugh Unit were recorded. The experiment was designed in simple randomized block with Four treatments and two temperatures. The result showed that the weight loss of egg and yolk index, were differ significantly in comparison to control while Haugh Unit at room temperature and Albumen Index did not differ significantly at room and refrigeration temperature. Refined Mustard Oil treated eggs prolonged the shelf-life of eggs to 28 and 75 days under room and refrigeration temperature while in control it was 14 days and 60 days under room and refrigeration condition.

Keywords: Yolk index, albumen index, Haugh unit

Introduction
Poultry production has emerged as an important and fastest growing sector of our livestock economy. Poultry farming has become very encouraging enterprise in modern India for small farmers, landless labours, educated un-employed youths as well as for big entrepreneurs. The gap between availability and the requirement shows a huge scope for further growth and development of poultry industry in India Egg is a rich source of high quality animal protein and is often used as standard for measuring the quality of the other food proteins. It is an important source of unsaturated fatty acid, minerals especially iron and phosphorus and almost all the vitamins. It is well balanced amino acid profile and easy digestibility makes it a valuable protective food in human diet. Egg is the wholesome food of animal origin, which cannot be adulterated by any human means till is reaches to ultimate consumer in original form. It is the only source of high quality proteinous food and is very useful to fight malnutrition in India. Egg being very useful in human diet requires proper preservation to ensure its acceptability for a longer period. Eggs are highly perishable commodity and need fast movement from the point of production to the point of consumption, particularly during summer months. It starts deteriorating from the moment it is laid. Research indicated that one out of every four egg produced in India did not reach to the consumer in good conditions. Oil coating is one of the most important methods for preserving eggs. The oil seals the pores of the shell which prevents the evaporation of moisture, entry of microorganism, odours and escape of gases. This checks the weight loss of egg and maintains the good internal quality for longer period because some of the physiochemical changes in the egg contents are being retarded. Keeping aforesaid points in view, the present investigation on Refined Mustard oil was undertaken with following objectives: To evaluate the changes in the internal quality and weight loss in oil coated and uncoated eggs held at room and refrigeration temperatures.

Materials and Methods
A total of 164 freshly laid, infertile eggs of a single strain of White Leghorn of same age and reared in cages under identical condition of feeding and management were procured from Central Avian Research Institute, Izatnagar, Bareilly, (U.P.). The eggs of almost similar and weight were selected for study. The candling was done at the time of procurement and before the start of experiment for selecting the sound egg.

RESEARCH ARTICLE Indian Journal of Animal Research, Volume 55 Issue 2: 189-192 (February 2021)

Studies on Serum Mineral Profile and Kidney Function of Broiler Chickens Fed Diets Containing Different Supplements

S.S. Chauhan[1], R.K. Sharma[2], D.V. Singh[1], S.K. Shukla[2], J. Palod[1], M.K. Singh[3]

10.18805/ijar.B-3934

ABSTRACT

The aim of the study was to investigate the effects of various feed supplements on minerals status and kidney health of broiler chickens. Two hundred fifty two, day-old Cobb-400 broiler chicks were randomly distributed into seven groups with 3 replicates of 12 chicks each. The first treatment was designated as control (T_1) in which no supplement was added to the feed, while in treatments T_2: organic mineral mixture (Organomin forte), T_3: organic mineral mixture (Vannamin), T_4: probiotics (Microguard), T_5: enzyme (Biozyme -XPR) and probiotics, T_6: emulsifier (Lipigon) were provided through feed. In T_7 group, 3 per cent less energy was given through feed. The serum calcium levels were significantly ($P<0.05$) increased in supplemented groups as compared to T_1 (control) group in both the periods while phosphorus values were significantly ($P<0.05$) increased in supplemented groups during starter period. Urea, Uric acid, BUN and creatinine values were significantly ($P<0.05$) decreased in supplemented groups as compared to T_1 group in both the periods. B/C ratios were significantly ($P<0.05$) decreased in all supplemented groups except T_5 and T_6 in both the periods. Therefore, it could be concluded that dietary supplementation maintained the mineral homeostasis and did not have adverse effect on kidney function.

Key words: Broiler chicks, Kidney function, Mineral profile, Supplements.

INTRODUCTION

The Indian broiler farmers rely on the commercial feeds produced by feed mill industries. In general, commercial broiler feeds have been formulated to meet the nutritional requirements of the birds. In some cases, the bad feed handling on the farm such as prolonged storage or inadequate storage conditions may, however, impair the nutritional qual-ities of the feeds. Such conditon may cause specific micronutrient deficiencies, especially minerals, leading to growth retardation in broilers (Aviagen, 2014). To optimize the growth potential of modern broilers in the commercial farms, the commercial broiler feeds are generally supplemented with organic mineral mixtures, probiotics, enzymes and emulsifiers.

Increased level of creatinine in serum can be indicative of kidney damage (Yalcin *et al*., 2012). Certain probiotic microorganisms have the ability to use urea, creatinine and other toxic chemicals as its nutrients for growth (Salim *et al*., 2011). Therefore, relatively low level creatinine may be an indication of the renal protective effects of the probiotic microorganism.

Hence, it would be interesting to investigate the effect of such dietary treatment on the performances and physiolog-ical responses of broiler chickens. Taken together, the present study aimed to investigate the effect of supplementation of various dietary supplements and their combination on their mineral homeostasis and kidney functions.

MATERIALS AND METHODS

Experimental birds and dietary treatments

The present study was undertaken at the Instructional Poultry Farm (IPF) of Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, U.S. Nagar. A total of 252, day old commercial broiler chicks (Cobb) were procured for conducting the experiment. All the chicks were individually weighed and randomly allotted to seven different groups each with three replicates of 12 chicks. Average body weight of chicks was similar for all the treatment groups. The study was conducted for a period of 6 weeks under standard management conditions. Feed and water were provided ad *libitum*. The detail of experimental diets is given in Table 1.

Serum analysis

Blood samples (2 ml) were taken from the wing vein of 6 fasting broilers per treatment groups on 21st and 42th day of experiment. Serum was obtained by centrifugation of blood at 3000 rpm for 10 min, and then it was frozen at -20°C for future analysis. Serum sodium (Na) and potassium (K) were

[1]Department of Livestock Production Management, G.B.P.U.A and T., Pantnagar-263 145, Uttarakhand, India.
[2]Department of Veterinary Medicine, G.B.P.U.A and T., Pantnagar-263 145, Uttarakhand, India.
[3]Department of Poultry Science, DUVASU, Mathura-281 001, Uttar Pradesh, India.
Corresponding Author: M.K. Singh, Department of Poultry Science, DUVASU, Mathura-281 001, Uttar Pradesh, India. Email: drmksingh_1@rediffmail.com

How to cite this article: Chauhan, S.S., Sharma, R.K., Singh, D.V., Shukla, S.K., Palod, J. and Singh, M.K. (2021). Studies on Serum Mineral Profile and Kidney Function of Broiler Chickens Fed Diets Containing Different Supplements. Indian Journal of Animal Research. 55(2): 189-192. DOI: 10.18805/ijar.B-3934.
Submitted: 05-10-2019 **Accepted:** 25-12-2019 **Online:** 15-04-2020

The Pharma Innovation Journal 2018; 7(12): 155-158

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(12): 155-158
© 2018 TPI
www.thepharmajournal.com
Received: 28-10-2018
Accepted: 29-11-2018

SS Chauhan
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

RK Sharma
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

DV Singh
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

SK Shukla
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

Jyoti Palod
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

Correspondence
SS Chauhan
Department of Livestock Production Management, College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India

Effect of organic mineral mixtures, probiotics, enzymes, emulsifier and liver supplements on serum protein and serum biochemical profile of broilers

SS Chauhan, RK Sharma, DV Singh, SK Shukla and Jyoti Palod

Abstract
A feeding trial was conducted to evaluate the effects of organic mineral mixture, probiotics, enzymes, emulsifier and liver supplements on serum protein profile and serum biochemical profile. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that at 42nd day, all the supplemented groups were significantly ($P<0.05$) higher in total protein than T_0 group. All the supplemented groups were significantly ($P<0.05$) higher in albumin than T_0 group. All the supplemented groups were significantly ($P<0.05$) higher in globulin than T_0 group. All the supplemented groups were significantly ($P<0.05$) higher in albumin/ globulin ratio than T_0 group. Glucose values in T_4 T_9 and T_{10} groups were significantly ($P<0.05$) lower than T_0 (control) group. Total cholesterol values in T_2, T_3, T_4 T_5, T_9 and T_{10} groups showed significant ($P<0.05$) decrease compared to the T_0 (control). HDL-cholesterol values in T_3, T_4, T_5, T_9 and T_{10} showed significant ($P<0.05$) increase compared to the T_0 (control). All the supplemented groups showed significant ($P<0.05$) decrease in LDL- cholesterol values compared to the T_0 (control) except T_6, T_7 and T_8. All the supplemented groups showed significant ($P<0.05$) decrease in triglycerides values compared to the T_0 (control) except T_6 and T_7. All the supplemented groups showed significant ($P<0.05$) decrease in AST values compared to the T_0 (control) except T_2, T_6, T_7 and T_8. All the supplemented groups showed significant ($P<0.05$) decrease in ALT values compared to the T_0 (control) except T_4 and T_5.

Keywords: Organic mineral mixtures, serum protein, serum biochemical

Introduction
Poultry is one of the fastest growing segments of the agricultural sector in India. Globally, India ranked 3rd after China and USA with a production of 88.1 billion eggs (2016 – 2017) and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat (2016- 2017). The poultry sector in totality accounts for 0.60 per cent of the national GDP (2017–2018). The annual egg and broiler production of India is 70 billion eggs and 3.8 million tons respectively, with per capita consumption of 68 eggs and 2.5 kg chicken meat against the ICMR recommendations of 180 eggs and 11 kg poultry meat (CARI VISION 2050) [1]. Poultry meat has significant role in Indian diet valued at US $ 6.6 billion. Favoured by socio- economic conditions like rising purchasing power and changing food habits of the people this sector is driven by ever increasing domestic demand. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected to cultural and religious restrictions. Rising input cost in poultry production has necessitated the need to look for feed supplements which can enhance the nutrient utilization efficiency of feeds thereby improving performance of poultry and resultant increase in profitability. In this context use of organic minerals, probiotics, enzymes, emulsifiers and liver supplements seems promising. Use of organic minerals in poultry diets has been shown to have multiple beneficial effects including higher absorption and increased antibody levels as they may provide alternative pathways for absorption, by decreasing mineral excretion. Similarly, use of probiotics and feed enzymes have been reported to regulate gut integrity, reduce digestive disorders, improve nutrient absorption/ feed efficiency, increases production, check the mortality and lowering of feed cost. Poultry produces emulsifiers in the form of bile, however, at times it is insufficient in view of added fats and oils. Also, as the digestive tract in young birds is not completely developed, fat absorption from the feed matrix is hampered. Hence, addition of emulsifier into the diet can overcome this problem by reducing the size of the fat globules forming small micelles and increasing the total surface available for enzymatic digestion.

International Journal of Livestock Research, Vol. 10 (11) Nov' 2020
http://www.ijlr.org
eISSN: 2277-1964
NAAS Rating 2020 – 5.36

Original Research

Studies on Haematological and Biochemical Parameters in Broiler Chickens Fed Diets Containing Different Supplements

S. S. Chauhan[1&2], R. K. Sharma[1], S. K. Sharma[1], S. K. Shukla[3], J. Palod[1] and M. K. Singh[1&4]*

[1]Department of Livestock Production Management, G.B.P.U.A & T, Pantnagar, Uttarakhand, INDIA
[2]Department of Livestock Production Management, NDUA& T, Ayodhya, Uttar Pradesh, INDIA
[3]Department of Veterinary Medicine, G.B.P.U.A & T, Pantnagar, Uttarakhand, INDIA
[4]Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, INDIA

*Corresponding Author: drmksingh_1@rediffmail.com

How to cite this paper: Chauhan, S., Sharma, R., Sharma, S., Shukla, S., Palod, J., & Singh, M. (2020). **Studies on haematological and biochemical parameters in broiler chickens fed diets containing different supplements.** *International Journal of Livestock Research*, 10(11), 132-139. doi: http://dx.doi.org/10.5455/ijlr.20200322044219

Received : Mar 22, 2020
Accepted : Aug 12, 2020
Published : Nov 30, 2020

Copyright © Chauhan *et al., 2020*

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). http://creativecommons.org/licenses/by/4.0/

Open Access

Abstract

The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the haematological and biochemical parameters. Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups, each with 3 replicates. The first treatment was designated as control (T0) in which no supplement was added to the feed, while in treatments T1; organic mineral mixture (Organomin forte), T2; organic mineral mixture (Vannamin), T3; probiotics (Microguard), T4; enzyme (Brozyme -XPR) and probiotics, T5; emulsifier (Lipigon) were provided through the feed. In the T6 group, 3 percent less energy was given through feed from 1st to 6th weeks of age respectively. TEC, MCHC, and DLC values were significantly increased in the broilers of feed supplemented groups in comparison to control. TLC, PCV and Hb and was significantly increased in the broilers of feed supplemented groups in comparison to control except the T6 group. MCV and MCH values were significantly ($P<0.05$) decreased in the broilers of supplemented groups in comparison to control. Biochemical estimations showed a significant increase in TSP, albumin, and globulin and AST and ALT significant decrease in supplemented groups.

Keywords: Biochemical Parameters, Haematological Parameters, Supplements, Ven Cobb400 Broilers

International Journal of Livestock Research, Vol. 10 (11) Nov' 2020
http://www.ijlr.org
eISSN: 2277-1964
NAAS Rating 2020 - 5.36

Original Research

Studies on Haematological and Biochemical Parameters in Broiler Chickens Fed Diets Containing Different Supplements

S. S. Chauhan[1&2], R. K. Sharma[1], S. K. Sharma[1], S. K. Shukla[3], J. Palod[1] and M. K. Singh[1&4]*

[1]Department of Livestock Production Management, G.B.P.U.A & T, Pantnagar, Uttarakhand, INDIA
[2]Department of Livestock Production Management, NDUA& T, Ayodhya, Uttar Pradesh, INDIA
[3]Department of Veterinary Medicine, G.B.P.U.A & T, Pantnagar, Uttarakhand, INDIA
[4]Department of Poultry Science, DUVASU, Mathura, Uttar Pradesh, INDIA

*Corresponding Author: drmksingh_1@rediffmail.com

How to cite this paper: Chauhan, S., Sharma, R., Sharma, S., Shukla, S., Palod, J., & Singh, M. (2020). **Studies on haematological and biochemical parameters in broiler chickens fed diets containing different supplements.** *International Journal of Livestock Research*, 10(11), 132-139. doi: http://dx.doi.org/10.5455/ijlr.20200322044219

Received : Mar 22, 2020
Accepted : Aug 12, 2020
Published : Nov 30, 2020

Copyright © Chauhan *et al., 2020*

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). http://creativecommons.org/licenses/by/4.0/

Open Access

Abstract

The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the haematological and biochemical parameters. Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups, each with 3 replicates. The first treatment was designated as control (T0) in which no supplement was added to the feed, while in treatments T1; organic mineral mixture (Organomin forte), T2; organic mineral mixture (Vannamin), T3; probiotics (Microguard), T4; enzyme (Brozyme -XPR) and probiotics, T5; emulsifier (Lipigon) were provided through the feed. In the T6 group, 3 percent less energy was given through feed from 1st to 6th weeks of age respectively. TEC, MCHC, and DLC values were significantly increased in the broilers of feed supplemented groups in comparison to control. TLC, PCV and Hb and was significantly increased in the broilers of feed supplemented groups in comparison to control except the T6 group. MCV and MCH values were significantly (P<0.05) decreased in the broilers of supplemented groups in comparison to control. Biochemical estimations showed a significant increase in TSP, albumin, and globulin and AST and ALT significant decrease in supplemented groups.

Keywords: Biochemical Parameters, Haematological Parameters, Supplements, Veri Cobb400 Broilers

The Pharma Innovation Journal 2020; SP-9(4): 53-56

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; SP-9(4): 53-56
© 2020 TPI
www.thepharmajournal.com
Received: 15-02-2020
Accepted: 18-03-2020

SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

RK Sharma
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

DV Singh
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

SK Shukla
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

Jyoti Palod
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

Corresponding Author:
SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya Uttar Pradesh, India

Comparative study of the effects of different feed supplements on feed conversion ratio and performance index of broiler chickens

SS Chauhan, RK Sharma, DV Singh, SK Shukla and Jyoti Palod

Abstract
A feeding trial was conducted to evaluate the Influence of organic mineral mixture, probiotics, enzymes, emulsifier and liver stimulants on Feed Conversion Ratio and Performance Index of broilers. For this purpose, a total of 396 day old broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that at 42nd day, All the supplemented group showed significant ($P<0.05$) lower in feed conversion ratio than T_0 (control) group except in T_8, T_7 and T_9 groups. All the supplemented group showed significant ($P<0.05$) higher in Performance Index than T_0 (control) group except in T_8, T_7 and T_9 groups.

Keywords: feed supplements, broiler chickens

Introduction
Poultry is one of the fastest growing segments of the agricultural sector in India with compound growth rates of 6% and 10% per annum in egg and broiler production. Globally, India ranked 3rd in after China and USA with a production of 88.1 billion eggs (2016-2017) and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat (BAHS, 2017). The per capita consumption of eggs and meat is about 69 eggs and 3.4 kg meat per person per annum in India. In the country, eggs and broilers has been shown to rise at a rate of 8 –10 per cent per annum. The poultry sector in totality accounts for 0.60 per cent of the national GDP (2017–2018). As per FAOSTAT (2016), world's per capita consumption of poultry meat has increased from 2.88 kg to 14.13 kg over the last five decades. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected cultural and religious restrictions. Broiler meat is rich in nutrients primarily as a source of protein (21.4g/ 100g) with fewer calories (119 kcal/ 100g). Organically complexed minerals may provide alternative pathways for absorption, by decreasing mineral excretion. Organic trace minerals (OTM) supplementation to broiler diet is not directly associated with improved broiler performance, a single or blend of OTM in diets has been shown to have multiple beneficial effects. Probiotics are live microbial feed supplements which beneficially affect the host poultry birds by improving its intestinal microbial balance (Isolauri *et al.*, 2004) [4]. *Lactobacillus spp, Saccharomyces cerevisiae* and *Bacillus coagulans* have been used as a source of probiotics for improving growth performance. Poultry naturally produces enzymes which help in digestion of feed nutrients. The benefits of using enzymes in poultry diets include not only enhanced bird performance. Poultry produce emulsifiers in the form of bile however it is at times insufficient in view of added fats and oils. Hence, addition of emulsifier from external sources becomes obligatory in poultry feed. Broilers fed the diet containing soybean oil and emulsifier presented higher body weight gain. Liver stimulants possess hepato – protective and hepatogenic properties, tone up liver resulting into increase utilization of nutrients and hence better performance. Keeping the above facts in view, an experiment was conducted to determine the effect of supplementation of organic mineral mixtures, probiotics, enzymes, emulsifier and liver stimulants on the Feed Conversion Ratio and Performance Index of broilers.

Materials and Methods
A total of 396 day old commercial broiler chicks (Cobb) were procured for conducting the experiment. All the chicks were individually weighed and randomly allotted to eleven different groups each with three replicates of 12 chicks.

Available online at www.ijpab.com

ISSN: 2320 – 7051
Int. J. Pure App. Biosci. SPI: **6 (1):** 63-68 (2018)
Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Carcass Traits of Broilers

S. S. Chauhan*, R. K. Sharma, D.V. Singh, S. K. Shukla and Jyoti Palod
Department of Livestock Production Management
College of Veterinary and Animal Sciences,
G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India
*Corresponding Author E-mail: nduatcss @gmail.com
Received: 5.05.2018 | Revised: 17.06.2018 | Accepted: 25.06.2018

ABSTRACT

A feeding trial was conducted to study the effects of organic mineral mixture, probiotics, enzymes, emulsifier and liver supplements on the carcass traits of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that maximum dressed yield with and without giblets at six weeks was noted in group T_{10} i.e. broilers supplemented with enzymes with probiotics, liver supplement 1 and emulsifier followed by T_4, T_6, T_3, T_5, T_2, T_1 and T_9. Similarly, all the supplemented groups showed significant ($P<0.05$) increase in the cut up parts compared to the control except T_8, T_7 and T_8. Supplemented groups also showed significant ($P<0.05$) decrease in the processing losses except in T_7 for blood loss & feather loss and in T_6 & T_7 for head loss. Thus, it may be concluded that supplementation has been found beneficial in yielding more edible meat with lesser dressing losses.

Key words: *Broilers, Enzymes, Probiotics, Organic mineral mixture, Emulsifier*

INTRODUCTION

Poultry is one of the fastest growing segments of the agricultural sector in India. India is the third largest egg producer after China and USA and the fourth largest poultry producer after China, Brazil and USA. The annual egg and broiler production of India is 70 billion eggs and 3.8 million tons respectively, with per capita consumption of 68 eggs and 2.5 kg chicken meat against the ICMR recommendations of 180 eggs and 11 kg poultry meat[1]. Poultry meat has significant role in Indian diet valued at US $ 6.6 billion. Favoured by socio- economic conditions like rising purchasing power and changing food habits of the people this sector is driven by ever increasing domestic demand. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected to cultural and religious restrictions. Rising input cost in poultry production has necessitated the need to look for feed supplements which can enhance the nutrient utilization efficiency of feeds thereby improving performance of poultry and resultant increase in profitability.

Cite this article: Chauhan, S.S., Sharma, R.K., Singh, D.V., Shukla, S.K. and Palod, J., Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Carcass Traits of Broilers, *Int. J. Pure App. Biosci.* SPI: **6(1):** 63-68 (2018).

Copyright © October, 2018; IJPAB

Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.1130

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **6 (5):** 1289-1295 (2018)

International Journal of Pure & Applied Bioscience

Research Article

OPEN ACCESS

Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Nutrient Utilization and Haematological Profile of broilers

S. S. Chauhan*, R. K. Sharma, D.V. Singh, S. K. Shukla and Jyoti Palod

Department of Livestock Production Management

College of Veterinary and Animal Sciences

G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand

Received: 4.07.2018 | Revised: 10.08.2018 | Accepted: 17.08.2018

ABSTRACT

A feeding trial was conducted to evaluate the effects of organic mineral mixture, probiotics, enzymes, emulsifier and liver supplements on nutrient utilization and haematological profile of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. Broilers of T_4, T_5, T_9 and T_{10} groups showed significantly ($P<0.05$) increase in dry matter utilization as compared to T_0 group. All the supplemented group showed significant ($P<0.05$) increase in crude protein utilization than T_0 group except T_8 and T_7. All the supplemented group showed significant ($P<0.05$) increase in ether extract utilization than T_0 group except T_8, T_7 and T_6. All the supplemented group showed significant ($P<0.05$) increase in calcium utilization than T_0 group except T_6, T_7 and T_8. All the supplemented group showed significant ($P<0.05$) increase in phosphorus utilization than T_0 group except T_6 and T_7. All the supplemented groups showed significant ($P<0.05$) increase in TEC, TLC, PCV and Hb compared to T_0 group at 42nd day. All the supplemented groups showed significant ($P<0.05$) increase in TLC compared to T_0 group except T_6 at 42nd day. All the supplemented groups showed significant ($P<0.05$) increase in PCV compared to T_0 group except T_6 at 42nd day. All the supplemented groups showed significant ($P<0.05$) increase in Hb compared to T_0 group at 42nd day. All the supplemented groups showed significant ($P<0.05$) decrease in MCV and MCH as compared to T_0 group at 42nd day. All the supplemented groups showed significant ($P<0.05$) decrease in MCHC compared to T_0 group except T_6 and T_7 at 42nd day.

Key words: *Broilers, Dry matter, Crude Protein, Probiotics, TEC*

INTRODUCTION

Poultry is one of the fastest growing segments of the agricultural sector in India. Globally, India ranked 3rd after China and USA with a production of 88.1 billion eggs and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat.

Cite this article: Chauhan, S.S., Sharma, R.K., Singh, D.V., Shukla, S.K. and Palod, J., Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Nutrient Utilization and Haematological Profile of broilers, *Int. J. Pure App. Biosci.* **6(5):** 1289-1295 (2018). doi: http://dx.doi.org/10.18782/2320-7051.1130

Copyright © Sept.-Oct., 2018; IJPAB

VOL. VIII, SPECIAL ISSUE, REPT NOV-2018 SEMINAR MIDAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7664
An International Refereed, Peer Reviewed & Indexed Quarterly journal in Science, Agriculture & Engineering

EFFECT OF ORGANIC MINERAL MIXTURES, PROBIOTICS, ENZYMES, EMULSIFIER AND LIVER SUPPLEMENTS ON SERUM BIOCHEMICAL AND SENSORY CHARACTERISTICS PARAMETERS OF BROILERS

S. S. Chauhan, R. K. Sharma, D.V. Singh, S. K. Shukla and JyotiPaliwal
Department of Livestock Production Management
College of Veterinary and Animal Sciences
G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand

Abstract

A feeding trial was conducted to evaluate the effects of organic mineral mixture, probiotics, enzymes, emulsifier and liver supplements onserum biochemical and sensory characteristics parameters of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that at 42nd day, glucose values in T_6, T_9 and T_{10} groups were significantly ($P<0.05$) lower than T_1 (control) group. Total cholesterol values in T_2, T_3, T_5, T_7, T_8 and T_{11} groups showed significant ($P<0.05$) decrease compared to the T_1 (control). HDL- cholesterol values in T_3, T_5, T_7, T_8 and T_{10} showed significant ($P<0.05$) increase compared to the T_1 (control). All the supplemented groups showed significant ($P<0.05$) decrease in LDL- cholesterolvalues compared to the T_1 (control) except T_6, T_7 and T_9. All the supplemented groups showed significant ($P<0.05$) decrease in triglycerides values compared to the T_1 (control) except T_6 and T_7. All the supplemented groups showed significant ($P<0.05$) decrease in AST values compared to the T_1 (control) except T_2, T_6, T_7 and T_9. All the supplemented groups showed significant ($P<0.05$) decrease in ALT values compared to the T_1 (control) except T_6.All the supplemented groups showed significant ($P<0.05$) increase in colour and appearance values compared to the T_1 (control) except T_6. All the supplemented groups showed significant ($P<0.05$) increase in flavour values compared to the T_1 (control). All the supplemented groups showed significant ($P<0.05$) increase in texture values compared to the T_1 (control) except T_7. All the supplemented groups showed significant ($P<0.05$) increase in juiciervalues compared to the T_1 (control) except T_7. All the supplemented groups showed significant ($P<0.05$) increase in overall acceptabilityvalues compared to the T_1 (control) except T_7.

Introduction

Poultry is one of the fastest growing segments of the agricultural sector in India. India is the third largest egg producer after China and USA and the fourth largest poultry producer after China, Brazil and USA. The annual egg and broiler production of India is 70 billion eggs and 3.8 million tons respectively, with per capita consumption of 68 eggs and 2.5 kg chicken meat against the ICMR recommendations of 180 eggs and 11 kg poultry meat (CARI VISION 2050). Poultry meat has significant role in Indian diet valued at US $ 6.6 billion. Favoured by socio- economic conditions like rising purchasing power and changing food habits of the people this sector is driven by ever increasing domestic demand. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected to cultural and religious restrictions. Rising input cost in poultry production has necessitated the need to look for feed supplements which can enhance the nutrient utilization efficiency of feeds thereby improving performance of poultry and resultant increase in profitability. In this context use of organic minerals, probiotics, enzymes, emulsifiers and liver supplements seems promising. Use of organic minerals in poultry diets has been shown to have multiple beneficial effects including higher absorption and increased antibody levels as they may provide alternative pathways for absorption, by decreasing mineral excretion. Similarly, use of probiotics and feed enzymes have been reported to regulate gut integrity, reduce digestive disorders, improve nutrient absorption, feed efficiency, increase production, check the mortality and lowering of feed cost. Poultry produces emulsifiers in the form of bile, however, at times it is insufficient in view of added fats and oils. Also, as the digestive tract in young birds is not completely developed, fat absorption from the feed matrix is hampered. Hence, addition of emulsifier into the diet can overcome this problem by reducing the size of the fat globules forming small micelles and increasing the total surface available for enzymatic digestion.The addition of synthetic emulsifier to broiler diets is a recent practice as compared to other dietary supplements. Polyherbal liver stimulants possess hepato – protective, hepatogenic, immunomodulatory and antioxidant properties, which tone up liver resulting in increased utilization of feed and better performance.Keeping the above facts in view, an experiment was conducted to determine the effect of supplementation of organic mineral mixtures, probiotics, enzymes, emulsifier and liver stimulants on the serum biochemical and sensory characteristics parameters of broilers.

Materials and Methods

A total number of 396 day old commercial broiler chicks (Cobb) were procured for undertaking the experiment. All the chicks were individually weighed and randomly allotted to eleven different groups each with three replicates of 12 chicks. The groups were designated as T_1: basal diet, T_2: chicks fed basal diet along with organic mineral mixture 1 (Organomin forte) @ 0.5 g per kg feed, T_3: basal diet along with organic mineral mixture 2 (Vitamomin) @ 0.5 g per kg feed,T_4: basal diet along with probiotics (Microgrand) @ 0.1g per kg feed,T_5: basal diet along with enzymes + probiotics (Biozyme - XPR) @ 0.5 g per kg feed, T_6: basal diet along with emulsifier (Lipigest) @ 0.5 g per kg feed, T_7: basal diet with 3% less energy, T_8: basal diet with 3% less energy along with liver supplement 1(Superliv protect) @ 0.5 g/kg feed, T_9: basal diet with 3%2 less energy along with liver supplement 2 (X- liv Pro) @ 0.5 g/kg feed, T_{10}: basal diet along with enzyme with probiotics (Biozyme - XPR), liver supplement 1(Superliv protect) and emulsifier (Lipigest) @ 0.5 g/kg feed.Average body weight of chicks was similar for all the treatment groups. The broiler chicks were housed in deep litter system under standard management practices. Blood samples were collected from six experimental birds of each group i.e. two broiler chicks from each replicate on 21st and 42nd day of experimental feeding. Glucose was done spectrophotometrically by enzymatic GOD-POD method with the help of Span Diagnostic Kit at 505 nm wavelength (Sacks, 1998). Total cholesterol was estimated spectrophotometrically using Span Diagnostic Kit with enzymatic CHOD-PAP method at 505 nm wavelength (Tietz, 1998). Triglycerides was estimated at 505 nm spectrophotometrically using Span Diagnostic Kit by GPO – PAP, end point assay (Stein and Mayer, 1995).HDL cholesterol concentration was estimated spectrophotometrically at 560 nm by phosphotungstate method (Tietz, 1998). LDL cholesterol was estimated by Beckman coulter model no-Au480 fully automatic biochemistry analyser. ALT was estimated using Ecoline diagnostic kit based on reference method of International Federation of Clinical Chemistry (IFCC) at 340 nm wavelengths (Bergmeyeret al.,1986). AST was measured by Kinetic method using Labkit diagnostic kit at 330 nm wavelength (Tietz, 1998). The sensory quality of meat samples was evaluated by meat descriptive analysis method (Keeton and Findlings, 1984). The experimental data obtained were analyzed statistically using completely randomized design (CRD) as per the

The Pharma Innovation Journal 2020; 9(5): 125-128

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(5): 125-128
© 2020 TPI
www.thepharmajournal.com
Received: 04-03-2020
Accepted: 06-04-2020

SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Sharma
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

DV Singh
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Shukla
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Jyoti Palod
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Body weight gain and feed intake of broiler chickens fed different feed supplements

SS Chauhan, RK Sharma, DV Singh, SK Shukla and Jyoti Palod

Abstract
A feeding trial was conducted to evaluate the effects of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Body Wt. Gain and Feed Intake parameters of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that at 21st and 42nd days Body Wt. Gain values in all the treatment groups were significantly ($P<0.05$) higher than T_0 (control) group except T_7 and T_8. At 21st and 42nd days Feed intake values in all the treatment groups were significantly ($P<0.05$) lower than T_0 (control) group except T_6 while whereas it increased significantly in T_7 and T_8 groups.

Keywords: Organic mineral mixture, probiotic, emulsifier

Introduction
Poultry is one of the fastest growing segments of the agricultural sector in India with compound growth rates of 6% and 10% per annum in egg and broiler production. Globally, India ranked 3rd in after China and USA with a production of 88.1 billion eggs (2016 – 2017) and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat (BAHS, 2017). The per capita consumption of eggs and meat is about 69 eggs and 3.4 kg meat per person per annum in India. In the country, eggs and broilers has been shown to rise at a rate of 8 –10 per cent per annum. The poultry sector in totality accounts for 0.60 per cent of the national GDP (2017–2018). As per FAOSTAT (2016), world's per capita consumption of poultry meat has increased from 2.88 kg to 14.13 kg over the last five decades. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected cultural and religious restrictions. Broiler meat is rich in nutrients primarily as a source of protein (21.4g/ 100g) with fewer calories (119 kcal/ 100g). Organically complexed minerals may provide alternative pathways for absorption, by decreasing mineral excretion. Organic trace minerals (OTM) supplementation to broiler diet is not directly associated with improved broiler performance, a single or blend of OTM in diets has been shown to have multiple beneficial effects. Probiotics are live microbial feed supplements which beneficially affect the host poultry birds by improving its intestinal microbial balance (Isolauri *et al*., 2004) [3]. *Lactobacillus spp. Saccharomyces cerevisiae* and *Bacillus coagulans* have been used as a source of probiotics for improving growth performance. Poultry naturally produces enzymes which help in digestion of feed nutrients. The benefits of using enzymes in poultry diets include not only enhanced bird performance. Poultry produce emulsifiers in the form of bile however it is at times insufficient in view of added fats and oils. Hence, addition of emulsifier from external sources becomes obligatory in poultry feed. Broilers fed the diet containing soybean oil and emulsifier presented higher body weight gain. Liver stimulants possess hepato – protective and hepatogenic properties, tone up liver resulting into increase utilization of nutrients and hence better performance. Keeping the above facts in view, an experiment was conducted to determine the effect of supplementation of organic mineral mixtures, probiotics, enzymes, emulsifier and liver stimulants on the body weight gain and feed intake parameters of broilers.

Materials and Methods
A total of 396 day old commercial broiler chicks (Cobb) were procured for conducting the experiment. All the chicks were individually weighed and randomly allotted to eleven different groups each with three replicates of 12 chicks.

Indian Journal of Poultry Science (2020) 55(1): 59-62, Research Article
DOI: 10.5958/0974-8180.2020.00009.4

Assessment of certain feed supplements on antibody titer, faecal pathogens and NPK contents of litter in broilers

S.S. CHAUHAN[1, 2], R.K. SHARMA[1], S.K. SINGH[1], S.K. SHUKLA[3], J. PALOD[1] AND M.K. SINGH[4*]

Department of Livestock Production Management (LPM), Govind Ballabh Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India

[1]Department of Livestock Production Management (LPM), Pantnagar-263145, Uttarakhand, India, [2]Department of Livestock Production Management (LPM), NDUA&T, Ayodhya-224229 (UP), [3]Department of Veterinary Medicine (VMD), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A&T), Pantnagar-263145, Uttarakhand, India, [4]Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281001 (UP)

(Received on March 19, 2020; accepted for publication on April 30, 2020)

ABSTRACT

Chauhan, S.S., Sharma, R.K., Singh, S.K., Shukla, S.K., Palod, J. and Singh, M.K. 2020. Assessment of certain feed supplements on antibody titer, faecal pathogens and NPK contents of litter in broilers. Indian Journal of Poultry Science, 55(1): 59-62.

The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the antibody titer, faecal pathogens and NPK contents of broilers for 6 weeks. Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups consisted of 3 replicates per treatment. The first treatment was designated as control (T_0) in which no supplement was added to the feed, while in treatments T_1: organic mineral mixture, T_2: organic mineral mixture, T_3: probiotics, T_4: enzyme and probiotics, T_5: emulsifier were provided through the feed. In the T_6 group, 3 percent less energy was given through feed. Immunoglobin G were significantly ($P<0.05$) increased and cortisol values decreased in supplemented groups as compared to the T_0 (control) group. The pathogens *viz., E. coli* and *Salmonella enteritidis* were found absent in the faeces of birds of all the experimental groups. The nitrogen, phosphorus and potassium values were significantly ($P<0.05$) increased in feed supplemented groups than the T_0 (control) group. The increase in IgG levels in supplemented groups indicated the better immune status of the birds whereas decreased levels of cortisol in the treated groups showed lower levels of stress.

Keywords: Broiler, Faecal pathogens, Immuno-modulatory effect, NPK contents, Litter

INTRODUCTION

In the last five decades, there has been considerable progress in the poultry industry due to improved genetics, nutrition, housing, and disease control. The ban on the use of antibiotics and restricted use of medication has aggravated the problems of poultry farmers along with the increased susceptibility of birds to various diseases and stressors. Effective control of diseases and improvement in the performance of birds is possible only by enhancing the bird's immune system. Along with environmental factors, external stressors and the genetic makeup of the birds, various nutrients also play an important role in attaining the competitive performance (Singh *et al.*, 2017). Feed manufacturers and nutritionists know very well about the feasibility to assemble well-balanced diets including all essential as well as minor nutrients.

The use of organic mineral mixtures improves performance, activates immune stimulation, optimizes minerals absorption and utilization and improves oxidative status in broiler chicks (Ravindran, 2013).

Probiotic (Micro-guard) on administration passes through stomach reaches intestine where it colonizes occupying the intestinal villi and prevents pathogens from attaching to the intestine and at the same time favours the growth of essential microflora in the gut. They also produce substances like bacteriocins and local acting antibiotics that are antagonistic to pathogens. It also secretes enzymes like protease, amylase, and lipase along with other nutrients and supplements which can be used by the lactic acid-producing and other useful bacteria to multiply rapidly and to sustain them for a longer time in the intestine. Further prevents *E. coli*, clostridium, coccidia and salmonella infections and reinforces the integrity of the gut wall and stimulates intestinal immunity-enhancing production of secretory antibodies (Chaudhary *et al.*, 2017).

The use of exogenous feed specific enzymes (Brozyme) breaks down non-starch polysaccharides (NSPs) in feed ensuring more nutrient bioavailability and reduces the viscosity of the gut caused by NSPs–improves intestinal absorption of nutrients. Prevent gut pathogens to ensure gut health (Narasimha *et al.*, 2016).

The non-ionic emulsifier (Lipigon) promotes performance and reducing the nutrition density of faeces. It aids fat-soluble vitamin absorption, increases energy: protein ratio retains moisture of feed and maintains its nutritive value and keeps liver free from fat deposits.

Keeping in view the above facts, it is necessary to increase the availability of dietary nutrients by different

*Corresponding Author Email: drmksingh_1@rediffmail.com

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EVALUATION OF THE EFFICACY OF REFINED GROUNDNUT OIL ON SHELF LIFE, PERCENTAGE LOSS IN EGG WEIGHT AND INTERNAL QUALITY CHARACTERISTICS OF WHITE LEGHORN HEN EGGS AT ROOM AND REFRIGERATION TEMPERATURE

S. S. Chauhan*, R. K. Sharma, D.V. Singh, S. K. Shukla , Jyoti Palod and Jaswant Singh*
*College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj Ayodhya

Abstract

A total of one hundred and sixty four fresh, infertile eggs of White Leghorn Hen Eggs were procured from a single flock of same age from Central Avian Research Institute, Izatnagar, Bareilly (UP). These 164 eggs were divided into 4 groups, each comprising of 41 eggs. These groups were categorized into two groups and were kept at room temperature and remaining two groups were kept in refrigerator. Room temperature noticed from 22°C to 38°C and relative humidity from 40 to 75 per cent. The temperature of refrigerator was noted as 8 ±1°C and relative humidity from 75 to 85 per cent. The Shelf Life, Percentage weight Loss, Albumin Index, Yolk Index and Haugh Unit were noted. The treatment T_2 and T_4 enhanced the Shelf- Life of eggs for a maximum period of 35 days at room and 90 days at refrigeration temperature. The untreated eggs T_1 and T_3 (control) maintained the organoleptically acceptable life for a period of 14 days and 60 days at room and refrigeration temperature, respectively. Significantly lower percentage of weight loss of eggs was found in Refined Groundnut Oil treated eggs. Significantly lower decline in Albumen Index was found in Refined Groundnut Oil treated eggs. Significantly lower decline in Yolk Index was found in Refined Groundnut Oil treated eggs. Significantly lower decline in Haugh Unit was found in Refined Groundnut Oil treated eggs.

Key Words – Shelf Life, Albumin Index, Yolk Index and Haugh Unit

Introduction

Poultry is one of the fastest growing segments of the agricultural sector in India. Globally, India ranked 3rd after China and USA with a production of 88.1 billion eggs (2016 – 2017) and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat (BAHS, 2017). The poultry sector in totality accounts for 0.60 per cent of the national GDP (2017–2018). The annual egg and broiler production of India is 70 billion eggs and 3.8 million tons respectively, with per capita consumption of 68 eggs and 2.5 kg chicken meat against the ICMR recommendations of 180 eggs and 11 kg poultry meat (CARI VISION 2050). Favoured by socio-economic conditions like rising purchasing power and changing food habits of the people this sector is driven by ever increasing domestic demand. Egg is a rich source of high quality of animal protein and is often used as standard for measuring the quality of the other food proteins. It is an important source of unsaturated fatty acids, minerals especially iron and phosphorus and almost all the Vitamins with the exception of Vitamin C. It is well balanced amino acid profile and easy digestibility makes it a valuable protective food in human diet. It is the only source of high quality proteinous food and is very useful to fight malnutrition in India. Oil coating is one of the most important methods for preserving eggs which can be safely applied by semi- skilled persons who are engaged in this profession by the daily or by the daily consumers. The oil seals the pores of the shell which prevents the evaporation of moisture, entry of microorganism, odours and escape of gases. This checks the weight loss of the egg and maintains the good internal quality for longer period because some of the physiochemical changes in the egg contents are being retarded.

Materials and Methods

A total of 164 White Leghorn Hen Eggs were divided into four groups each comprising 41 eggs. The following four treatments were done and were designated as T_1: Untreated eggs used as control kept at room temperature. T_2: Dipping in the Refined Groundnut Oil kept at room temperature. T_3: Untreated eggs used as control and kept at refrigeration temperature. T_4: Dipping in Refined Groundnut Oil and kept at refrigeration temperature. Weekly weight loss determinations were done for control and oiled eggs held at room temperature.Whereas the same were studied at fortnightly intervals for the eggs which were stored in refrigerator. Albumen and Yolk Indices were determined by the method of Heiman and Carver (1936) and Funk (1948) respectively. The Haugh Unit was measured according to Haugh (1937). The data were analysed statistically as per methods given by Panse and Sukhatme (1957).

Results and Discussion

The Results of the present study have been presented under following heads:

Effect of Refined Groundnut Oil treatment on the shelf- life of eggs

The treatment T_2 and T_4 increased the shelf life 35 days at room temperature and 90 days at refrigeration temperature. The minimum storage life was found in control (un- oiled) eggs where it was 14 days and 60 days under room and refrigeration conditions, respectively.

Table -1: Effect of Refined Groundnut Oil treatment on the shelf-life of eggs at room and refrigeration temperatures

Treatments	Shelf- life of eggs in days at different temperatures.	
	Room Temperature (30±8°C; 40 – 75%RH)	Refrigeration Temperature (8±1°C; 75 – 80% RH)
T_1 (Control)	14	60
T_2	35	90

The superiority of Refined Groundnut Oil in extending the shelf-life of eggs at both the atmospheric conditions might be due to their better shell pore sealing property and therefore, there had been a less loss of moisture and CO_2 from the eggs coated by Refined Groundnut Oil coating media.

Effect of Refined Groundnut Oil treatment on the Percentage loss in weight of oil coated and un-coated eggs at weekly interval kept at room temperature

There was a very slow rate of decrease in weight of oil coated eggs in comparison to control. At room temperature the maximum percentage loss in egg weight was observed in T_1 (control) group (7.7%) after 14 days of storage which was significantly higher than that of oil treated eggs. The minimum loss in egg weight during storage was found in T_2 (0.37%).

Table- 2: Percentage loss in weight of oil coated and un-coated eggs at weekly interval kept at room temperature

Treatments	Days of storage		Overall mean
	D1 (7 days)	D2 (14 days)	
T_1 (Control)	4.290	7.708	5.999
T_2	0.016	0.376	0.196

CD 5% = 1.99

Effect of Refined Groundnut Oil treatment on the Percentage loss in weight of oil coated and un-coated eggs at fortnightly interval kept at refrigeration temperature

At refrigeration temperature significantly, highest loss in egg weight was recorded in untreated eggs (T_3) to the extent of 9.11%. The

Available online at www.ijpab.com

ISSN: 2320 – 7051
Int. J. Pure App. Biosci. SPI: **6 (1)**: 63-68 (2018)
Research Article

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Carcass Traits of Broilers

S. S. Chauhan*, R. K. Sharma, D.V. Singh, S. K. Shukla and Jyoti Palod
Department of Livestock Production Management
College of Veterinary and Animal Sciences,
G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India
*Corresponding Author E-mail: nduatcss @gmail.com
Received: 5.05.2018 | Revised: 17.06.2018 | Accepted: 25.06.2018

ABSTRACT

A feeding trial was conducted to study the effects of organic mineral mixture, probiotics, enzymes, emulsifier and liver supplements on the carcass traits of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that maximum dressed yield with and without giblets at six weeks was noted in group T_{10} i.e. broilers supplemented with enzymes with probiotics, liver supplement 1 and emulsifier followed by T_4, T_6, T_3, T_5, T_2 , T_1 and T_9. Similarly, all the supplemented groups showed significant ($P<0.05$) increase in the cut up parts compared to the control except T_8, T_7 and T_9. Supplemented groups also showed significant ($P<0.05$) decrease in the processing losses except in T_7 for blood loss & feather loss and in T_6 & T_7 for head loss. Thus, it may be concluded that supplementation has been found beneficial in yielding more edible meat with lesser dressing losses.

Key words: *Broilers, Enzymes, Probiotics, Organic mineral mixture, Emulsifier*

INTRODUCTION

Poultry is one of the fastest growing segments of the agricultural sector in India. India is the third largest egg producer after China and USA and the fourth largest poultry producer after China, Brazil and USA. The annual egg and broiler production of India is 70 billion eggs and 3.8 million tons respectively, with per capita consumption of 68 eggs and 2.5 kg chicken meat against the ICMR recommendations of 180 eggs and 11 kg poultry meat[1]. Poultry meat has significant role in Indian diet valued at US $ 6.6 billion. Favoured by socio- economic conditions like rising purchasing power and changing food habits of the people this sector is driven by ever increasing domestic demand. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected to cultural and religious restrictions. Rising input cost in poultry production has necessitated the need to look for feed supplements which can enhance the nutrient utilization efficiency of feeds thereby improving performance of poultry and resultant increase in profitability.

Cite this article: Chauhan, S.S., Sharma, R.K., Singh, D.V., Shukla, S.K. and Palod, J., Effect of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Carcass Traits of Broilers, *Int. J. Pure App. Biosci.* SPI: **6(1)**: 63-68 (2018).

Copyright © October, 2018; IJPAB

Indian Journal of Poultry Science (2020) 55(1): 59-62, Research Article
DOI: 10.5958/0974-8180.2020.00009.4

Assessment of certain feed supplements on antibody titer, faecal pathogens and NPK contents of litter in broilers

S.S. CHAUHAN[1, 2], R.K. SHARMA[1], S.K. SINGH[1], S.K. SHUKLA[3], J. PALOD[1] AND M.K. SINGH[4*]

[1]Department of Livestock Production Management (LPM), Govind Ballabh Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India
[2]Department of Livestock Production Management (LPM), Pantnagar-263145, Uttarakhand, India, [3]Department of Livestock Production Management (LPM), NDUA&T, Ayodhya-224229 (UP), [4]Department of Veterinary Medicine (VMD), Govind Ballabh Pant University of Agriculture and Technology (G.B.P.U.A&T), Pantnagar-263145, Uttarakhand, India, [4]Department of Poultry Science (PSC), Uttar Pradesh Pandit Deen Dayal Upadhyaya University of Veterinary Sciences and Cattle Research Institute (DUVASU), Mathura-281001 (UP)

(Received on March 19, 2020; accepted for publication on April 30, 2020)

ABSTRACT

Chauhan, S.S., Sharma, R.K., Singh, S.K., Shukla, S.K., Palod, J. and Singh, M.K. 2020. Assessment of certain feed supplements on antibody titer, faecal pathogens and NPK contents of litter in broilers. Indian Journal of Poultry Science, 55(1): 59-62.

The present study evaluated the effect of dietary inclusion of various feed supplements and their combination on the antibody titer, faecal pathogens and NPK contents of broilers for 6 weeks. Day-old broiler chicks (n=252) were randomly assigned to seven treatment groups consisted of 3 replicates per treatment. The first treatment was designated as control (T_0) in which no supplement was added to the feed, while in treatments T_1: organic mineral mixture, T_2: organic mineral mixture, T_3: probiotics, T_4: enzyme and probiotics, T_5: emulsifier were provided through the feed. In the T_6 group, 3 percent less energy was given through feed. Immunoglobin G were significantly ($P<0.05$) increased and cortisol values decreased in supplemented groups as compared to the T_0 (control) group. The pathogens *viz., E. coli* and *Salmonella enteritidis* were found absent in the faeces of birds of all the experimental groups. The nitrogen, phosphorus and potassium values were significantly ($P<0.05$) increased in feed supplemented groups than the T_0 (control) group. The increase in IgG levels in supplemented groups indicated the better immune status of the birds whereas decreased levels of cortisol in the treated groups showed lower levels of stress.

Keywords: Broiler, Faecal pathogens, Immuno-modulatory effect, NPK contents, Litter

INTRODUCTION

In the last five decades, there has been considerable progress in the poultry industry due to improved genetics, nutrition, housing, and disease control. The ban on the use of antibiotics and restricted use of medication has aggravated the problems of poultry farmers along with the increased susceptibility of birds to various diseases and stressors. Effective control of diseases and improvement in the performance of birds is possible only by enhancing the bird's immune system. Along with environmental factors, external stressors and the genetic makeup of the birds, various nutrients also play an important role in attaining the competitive performance (Singh *et al.*, 2017). Feed manufacturers and nutritionists know very well about the feasibility to assemble well-balanced diets including all essential as well as minor nutrients.

The use of organic mineral mixtures improves performance, activates immune stimulation, optimizes minerals absorption and utilization and improves oxidative status in broiler chicks (Ravindran, 2013).

Probiotic (Micro-guard) on administration passes through stomach reaches intestine where it colonizes occupying the intestinal villi and prevents pathogens from attaching to the intestine and at the same time favours the growth of essential microflora in the gut. They also produce substances like bacteriocins and local acting antibiotics that are antagonistic to pathogens. It also secretes enzymes like protease, amylase, and lipase along with other nutrients and supplements which can be used by the lactic acid-producing and other useful bacteria to multiply rapidly and to sustain them for a longer time in the intestine. Further prevents *E. coli*, clostridium, coccidia and salmonella infections and reinforces the integrity of the gut wall and stimulates intestinal immunity-enhancing production of secretory antibodies (Chaudhary *et al.*, 2017).

The use of exogenous feed specific enzymes (Brozyme) breaks down non-starch polysaccharides (NSPs) in feed ensuring more nutrient bioavailability and reduces the viscosity of the gut caused by NSPs–improves intestinal absorption of nutrients. Prevent gut pathogens to ensure gut health (Narasimha *et al.*, 2016).

The non-ionic emulsifier (Lipigon) promotes performance and reducing the nutrition density of faeces. It aids fat-soluble vitamin absorption, increases energy: protein ratio retains moisture of feed and maintains its nutritive value and keeps liver free from fat deposits.

Keeping in view the above facts, it is necessary to increase the availability of dietary nutrients by different

*Corresponding Author Email: drnksingh_1@rediffmail.com

The Pharma Innovation Journal 2020; 9(5): 125-128

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(5): 125-128
© 2020 TPI
www.thepharmajournal.com
Received: 04-03-2020
Accepted: 06-04-2020

SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Sharma
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

DV Singh
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

SK Shukla
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Jyoti Palod
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
SS Chauhan
Department of Livestock Production Management College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Body weight gain and feed intake of broiler chickens fed different feed supplements

SS Chauhan, RK Sharma, DV Singh, SK Shukla and Jyoti Palod

Abstract
A feeding trial was conducted to evaluate the effects of Organic Mineral Mixtures, Probiotics, Enzymes, Emulsifier and Liver Supplements on Body Wt. Gain and Feed Intake parameters of broilers. For this purpose, a total of 396 day-old commercial broiler chicks (Cobb) were used and randomly allocated into 11 groups with three replicates of 12 chicks each. The results revealed that at 21st and 42nd days Body Wt. Gain values in all the treatment groups were significantly ($P<0.05$) higher than T_0 (control) group except T_7 and T_8. At 21st and 42nd days Feed intake values in all the treatment groups were significantly ($P<0.05$) lower than T_0 (control) group except T_8 while whereas it increased significantly in T_7 and T_8 groups.

Keywords: Organic mineral mixture, probiotic, emulsifier

Introduction
Poultry is one of the fastest growing segments of the agricultural sector in India with compound growth rates of 6% and 10% per annum in egg and broiler production. Globally, India ranked 3rd in after China and USA with a production of 88.1 billion eggs (2016 – 2017) and 6th after USA, China, Brazil, Mexico and Indonesia with a production of 3.46 million tons of chicken meat (BAHS, 2017). The per capita consumption of eggs and meat is about 69 eggs and 3.4 kg meat per person per annum in India. In the country, eggs and broilers has been shown to rise at a rate of 8 –10 per cent per annum. The poultry sector in totality accounts for 0.60 per cent of the national GDP (2017–2018). As per FAOSTAT (2016), world's per capita consumption of poultry meat has increased from 2.88 kg to 14.13 kg over the last five decades. Poultry meat is an excellent source of high quality protein, vitamins, and minerals and is not subjected cultural and religious restrictions. Broiler meat is rich in nutrients primarily as a source of protein (21.4g/ 100g) with fewer calories (119 kcal/ 100g). Organically complexed minerals may provide alternative pathways for absorption, by decreasing mineral excretion. Organic trace minerals (OTM) supplementation to broiler diet is not directly associated with improved broiler performance, a single or blend of OTM in diets has been shown to have multiple beneficial effects. Probiotics are live microbial feed supplements which beneficially affect the host poultry birds by improving its intestinal microbial balance (Isolauri *et al*., 2004) [5]. *Lactobacillus spp, Saccharomyces cerevisiae* and *Bacillus coagulans* have been used as a source of probiotics for improving growth performance. Poultry naturally produces enzymes which help in digestion of feed nutrients. The benefits of using enzymes in poultry diets include not only enhanced bird performance. Poultry produce emulsifiers in the form of bile however it is at times insufficient in view of added fats and oils. Hence, addition of emulsifier from external sources becomes obligatory in poultry feed. Broilers fed the diet containing soybean oil and emulsifier presented higher body weight gain. Liver stimulants possess hepato – protective and hepatogenic properties, tone up liver resulting into increase utilization of nutrients and hence better performance. Keeping the above facts in view, an experiment was conducted to determine the effect of supplementation of organic mineral mixtures, probiotics, enzymes, emulsifier and liver stimulants on the body weight gain and feed intake parameters of broilers.

Materials and Methods
A total of 396 day old commercial broiler chicks (Cobb) were procured for conducting the experiment. All the chicks were individually weighed and randomly allotted to eleven different groups each with three replicates of 12 chicks.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(4): 1812-1817
Received: 27-05-2017
Accepted: 30-06-2017

Ajit Kumar Singh
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

B Om Preethi
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

HN Singh
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

AK Gangwar
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

D Niyogi
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Kh Sangeeta Devi
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Ajit Kumar Singh
College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Comparative evaluation of the wound healing potential of *Tinospora cordifolia* and its combination with local Insulin therapy in diabetic rabbits

Ajit Kumar Singh, B Om Preethi, HN Singh, AK Gangwar, D Niyogi and Kh Sangeeta Devi

Abstract
Wound healing is impaired in diabetes mellitus. Therefore, the present study was carried out for the evaluation of healing potential of *Tinospora cordifolia* and its combination with local Insulin therapy in diabetic wounds. Diabetes was induced in the animals of group I and II. The wounds were created on the thoraco-lumbar area in each animal under general anesthesia. The animals of group I were treated with oral suspension prepared from methanolic extract of *T. cordifolia* stem and the animals of group II were treated with combination of oral *T. cordifolia* and local insulin therapy. The soframycin ointment was applied over wounds in both the groups. The rate of wound healing was assessed on the basis of colour digital imaging, wound morphometery, histopathological and Scanning Electron Microscopic (SEM) studies. On the basis of observations, the rate of wound healing recorded in group II animals was significantly higher and better than group I.

Keywords: healing potential, *Tinospora cordifolia*, Insulin therapy

Introduction

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia and alteration in carbohydrate, fat and protein metabolism associated with absolute or relative deficiency of insulin secretion and/or insulin action (Kameswara *et al.*, 2003) [14]. It is one of the major contributors to delayed wound healing. Wound healing is the restoration of tissue architecture and function following an injury (Kumar *et al.*, 2007) [17]. Normal wound healing is a complex phenomenon covering four overlapping phases i.e. inflammation, proliferation, remodeling and maturation (Sumitra *et al.*, 2005) [5]. In diabetes mellitus, all these four phases are hampered and the wound remains in a chronic inflammatory state and fails to heal in a timely and orderly manner. Hyperglycemia and infection are the major causes for the delayed wound healing (Sandhya *et al.*, 2011) [30]. Bacteria thrive on the increased glucose available in the bloodstream, and that at the same time the high glucose concentration inhibits neutrophil action, leading to a proliferation of bacteria and infection. Infection and inflammation lead to imbalance of protease and reactive oxygen species, essential growth factors are degraded, the ability of angiogenesis is impaired and cell recruitment to the wound sites is inhibited (Blakytny and Jude 2006) [4]. All these factors hampering the process of healing make the management of diabetic wounds difficult.

It has been proposed that absolute or relative lack of insulin contributes to delayed wound healing in diabetes (McIntosh and Pederson 1999) [24]. Clinical and animal experiments have indicated that local treatment with insulin may improve wound healing in diabetes (Madibally *et al.*, 2003) [22]. The role of topical insulin in the promotion of wound healing in several animal models has been reported by previous workers (Liu *et al.*, 2005; Zhang *et al.*, 2007) [20, 40]. In addition, insulin injected diffusely into the wound can accelerate wound re-epithelialization (Zhang *et al.*, 2007) [40]. In modern medicine, no satisfactory effective therapy is still available to cure the diabetic wounds and associated complications. Though insulin and other modern therapies are being used for the management of diabetic wounds, but they also have drawbacks like resistance (Piedrola *et al.*, 2001) [25]. Moreover, the modern therapeutic treatments are very expensive. Thus, all these factors compel for the search of safe and affordable alternatives with minimal adverse effects, which can be taken for long durations. Recently, there has been increasing interest in the use of medicinal plants. *Tinospora cordifolia* is one of them. It is a deciduous climbing shrub of the family *Menispermaceae*. It is distributed throughout the Indian subcontinent and China (Singh *et al.*, 2003) [33].

Scanned with CamScanner

International Archive of Applied Sciences and Technology
Int. Arch. App. Sci. Technol; Vol 8 [4] December 2017: 72-79
© 2017 Society of Education, India
[ISO9001: 2008 Certified Organization]
www.soeagra.com/iaast.html

IAAST
ONLINE ISSN 2277- 1565
PRINT ISSN 0976 - 4828

CODEN: IAASCA ORIGINAL ARTICLE

DOI: .10.15515/iaast.0976-4828.8.4.7279

Comparative Evaluation of the Wound healing efficacy of *Tinospora cordifolia* and local Insulin therapy in diabetic rabbits

Ajit Kumar Singh*, H.N. Singh, B. Om Preethi, A.K. Gangwar, Kh. Sangeeta Devi, D. Niyogi and D.D. Singh

College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh-224229, India.

*Corresponding author: drajitsingh1653@gmail.com

ABSTRACT

Diabetes mellitus is one of the major contributors to delayed wound healing. So far there is no significantly effective therapy for diabetic wound healing. The present study aimed to evaluate the healing efficacy of Tinospora cordifolia and local insulin therapy in diabetic wounds. Eighteen animals were made diabetic using alloxan monohydrate. These animals were divided into two groups A and B each having nine animals. The wounds were created on the thoraco-lumbar area in each animal under general anesthesia. The animals of group A were treated with oral suspension prepared from methanolic extract of T. cordifolia stem and the animals of group B were treated with local insulin therapy. The soframycin ointment was applied over wounds in both the groups. The wound healing efficacy of T. cordifolia and local insulin therapy was assessed on the basis of wound condition, colour digital imaging, wound morphometery, histopathological and Scanning Electron Microscopic (SEM) studies. The rate of wound healing recorded in group B was significantly higher and better than group A. On the basis of observations of this study, it was concluded that T. cordifolia and local insulin therapy both enhanced the rate of healing in diabetic wounds but local insulin therapy shown the better healing efficacy.

Key words: *Diabetes mellitus, Wound healing, Tinospora cordifolia and Insulin.*

Received 22.06.2017 **Revised 22.07.2017** **Accepted 20.08.2017**

Citation of this article

A K Singh, H.N. Singh, B. Om Preethi, A.K. Gangwar, Kh. Sangeeta Devi, D. Niyogi and D.D. Singh. Comparative Evaluation of the Wound healing efficacy of *Tinospora cordifolia* and local Insulin therapy in diabetic rabbits. Int. Arch. App. Sci. Technol: Vol 8 [4] December 2017. 72-79.

INTRODUCTION

Normal wound healing is a well orchestrated process that results in restoration of tissue integrity. This process is hampered in Diabetes mellitus leading to delayed wound healing. Persistence of inflammation and neutrophil infiltration are characteristics associated with impaired wound healing in diabetes [1,2]. Hyperglycemia is responsible for the development of infections in diabetic wounds. Bacteria thrive on the increased glucose available in the bloodstream and at the same time the high glucose concentration inhibits neutrophil action, leading to a proliferation of bacteria and infection. Infection and inflammation lead to imbalance of protease and reactive oxygen species, essential growth factors are degraded, the ability of angiogenesis is impaired and cell recruitment to the wound sites is also inhibited [3] consequently wound remains in a chronic inflammatory state. Management of such wounds poses a great challenge. Recently, there has been increasing interest in the use of medicinal plants because of their antidiabetic and wound healing properties. *Tinospora cordifolia* is one of them (Fig. 1a and 1b). It is a deciduous climbing shrub of the family *Menispermaceae.* It is distributed throughout the Indian subcontinent and China [4]. The plant has been reported as anti-diabetic and anti-hyperglycemic [5], anti-inflammatory [6], antioxidant [7], anti-stress [8] and wound healing properties [9]. In Diabetes mellitus there is absolute or relative lack of insulin which contributes to wound healing complications [10]. The role of local insulin in the promotion of wound healing has been reported by several workers [11,12,13]. It stimulates the growth and development of different cell types, and affects proliferation, migration and secretion by keratinocytes, endothelial cells, and fibroblasts [14]. It also stimulates protein turnover [15]

Scanned with CamScanner

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

DECELLULARIZATION OF SKIN AND FISH SWIM BLADDER

Kh. Sangeeta Devi, A. K. Gangwar*, Mahesh Kumar Verma, Ravi Prakash Goyal, Ranjeet Kumar and Yogendra Singh
Department of Veterinary Surgery & Radiology, College of Veterinary Science And Animal Husbandry, Narendra Deva University Of Agriculture And Technology, Kumarganj, Faizabad-224 229 (U.P.)

Abstract
Biologic scaffolds are typically procured by processes that involve decellularization of tissues or organs. Preservation of the complex composition and three-dimensional architecture of the extracellular matrix is highly desirable but it is established fact that most methods of decellularization result in disruption of the architecture and leads to potential loss of surface structure and composition. An overview of decellularization of skin and fish swim bladder, their effect upon resulting ECM structure and composition are presented herein.
Key words: Decellularization, Skin, Fish swim bladder

Introduction

Biomaterials have become critical components in the development of effective new medical therapies for wound care. Natural collagenous materials are being investigated for surgical repair because of inherent low antigenicity and their ability to integrate with surrounding tissue (Gangwar *et al.*, 2015). Xenogeneic and allogeneic cellular antigens are recognized as foreign by the host and result in an adverse inflammatory response or overt immune-mediated rejection of the tissue (Erdag *et al.*, 2004). The effective removal of antigenic epitopes associated with cell membranes and intracellular components of tissues and organs is necessary to minimize or avoid an adverse immunologic response by allogeneic and xenogenic recipients of the biological scaffold materials (Schmidt and Baier, 2000).

The use of natural biomaterials has typically pre-treatment aimed at (1) preserving the tissue by enhancing the resistance of material to enzymatic or chemical degradation, (2) reducing the immunogenicity of the material, and (3) sterilizing the tissue (Schmidt and Baier, 2000). Biological materials composed of extracellular matrix are typically processed by methods that include decellularization and/or chemical cross-linking to remove or mask antigenic epitopes, DNA, and damage associated molecular pattern (DAMP) molecules (Gilbert *et al.*, 2006, Bianchi *et al.*, 2007). Biomaterials composed of decellularised ECM have been shown to promote the healing process via modulation of the host immune response, resistance to bacterial infections, allowing reinnervation and reestablishing homeostasis in the healing region (Badylak and Gilbert, 2008, Badylak *et al.*, 2009). Biological tissues from both allogenic and xenogenic sources have been used for surgical repair of tissue defects (Kumar *et al.*, 2012).

The fish swim bladder or air bladder or gas bladder is a white glistering, two chambered organs developing as a diverticulum from the wall of the pharynx in the gut of fish. It is a rich source of Type I collagen (Rose *et al.*, 1998). Most fish collagens have been found to consist of two α-chain variants, which are normally designated as α_1 and α_2. It consists of one-third glycine, contains no tryptophan or cysteine and is very low in tyrosine and histidine. Alpha-2 has a higher affinity for SDS and consequently exhibits a higher mobility than α1 (Kubo and Takagi, 1984). Rose *et al.* (1998) extracted collagen from swim bladder of fish. Kumar *et al.* (2015) Decellularised the fish swim bladder using sodium deoxycholate resulted in a complete loss of cellular structures. The tunica externa and interna were completely acellular. The collagen fibres were loosely arranged than the native tissue.

The cell extraction from biological tissues may remove their cellular antigens (Courtman *et al.*, 1994). As a means for reducing the antigenic response to xenograft materials, extraction removes lipid membranes and membrane-associated antigens as well as soluble proteins (Courtman *et al.*, 2001). However, even with complete extraction of cellular proteins, it would still be anticipated a cross-species response directed toward the structural proteins if acellular tissues were used as a xenograft (Liang *et al.*, 2004). This cross-species response due to the structural proteins may be further reduced by crosslinking (Olde Damink *et al.*, 1996). The high enzymatic turnover rate of extracellular matrix (ECM) *in vivo* makes stabilization of collagen-based biomaterials necessary. This can be achieved by chemical cross-linking methods, which provide biomaterials with desired mechanical properties for implantation and defect repair (Jorge-Herrero *et al.*, 1999). Several chemical agents have been used to achieve this goal. Glutaraldehyde (GA) is the most widely used reagent for cross-linking collagen. However, GA is associated with cytotoxicity *in vitro* and *in vivo*, caused by the presence of unreacted functional groups or by the release of those groups during enzymatic degradation of the cross-linked biomaterials (Huang-Lee *et al.*, 1990). Use of EDC to crosslink collagen seems to yield biomaterials with good biocompatibility, higher cellular differentiation potential (Ponticiello *et al.*, 2000) and with increased resistance against enzymatic degradation (Olde Damink *et al.*, 1996).

Decellularization of biomaterials

The goal of a decellularization is to efficiently remove all cellular and nuclear material while minimizing any adverse effect on the composition, biological activity, and mechanical integrity of the remaining extra cellular matrix (Gilbert *et al.*, 2006). Decellularization can be brought about by specific physical, chemical, and enzymatic methods which leave a material composed essentially of extra cellular matrix components. These acellular tissues retained their natural mechanical properties and promote remodeling of the prosthesis by neovascularization and recellularization by the host (Schmidt and Baier, 2000).

A decellularization protocol generally begins with lysis of the cell membrane using physical treatments or ionic solutions, followed by separation of cellular components from the ECM using enzymatic treatments, solubilisation of cytoplasmic and nuclear cellular components using detergents, and finally removal of cellular debris from the tissue. These steps can be coupled with mechanical agitation to increase their effectiveness (Gilbert *et al.*, 2006).

Ionic detergents are effective for solubilizing both cytoplasmic and nuclear cellular membranes but tend to denature proteins by disrupting protein–protein interactions (Seddon *et al.*, 2004). Sodium deoxycholate is very effective for removing cellular remnants but tends to cause greater disruption to the native tissue architecture when compared to sodium dodecyl sulphate (Gilbert *et al.*, 2006). Osmotic shock with a hypotonic or hypertonic solution such as deionized water or low ionic strength solution is used to lyse the cells within tissues and organs (Woods *et al.*, 2005).

Decellularization of the skin has been done by various chemical and enzymatic techniques to remove the cellular components, yet residual cellular components and lipids could not be removed. That might have promoted the undesired effects such as calcification and host immune response resulting inflammatory reaction in the recipient. It was also mentioned that, even after the removal of cells and debris from the biomaterials the extracellular matrix of the acellular tissue itself might elicit some amount of immune response (Coito and Kupiec-Weglinsky, 1996).

Following decellularization, all residual chemicals must be removed to avoid an adverse host tissue response to the chemical (Gilbert *et al.*, 2006). Acellular scaffolds have been used successfully in animals (Gangwar *et al.*, 2006). Removal of cells from the tissue leaves the complex mixture of structural and functional proteins that constitute the ECM. Decellularization of tissues can be done by physical

Scanned with CamScanner

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

OCULAR SETARIASIS IN A HORSE
A CASE STUDY

Yogendra Singh[1], Ravi Prakash Goyal[1], Ranjeet Kumar[1], Kh. Sangeeta Devi[2], Anil Kumar Gangwar*[3]

Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224 229, Ayodhya (UP)

Abstract

A 4 years horse was presented at the Veterinary Clinical Complex, Ayodhya, Uttar Pradesh, India, with impaired vision and cloudiness in the left eye. On close examination, a thread like larva was seen in the anterior chamber of the eye and was later diagnosed as setariasis. Finally, the setaria was removed by surgery aspirating it with a 16 gauge hypodermic needle. To avoid recurrence, Ivermectin was administered @ 200 µg/kg. setaria larva was collected and recovery was uneventful. Opacity cleared in about 3 weeks.

KEY WORDS: Eye worm, Paracentesis

Introduction

Ocular Setariosis in horses reported from many parts of India including Jammu and Kashmir [1]. It is an intra ocular helminth parasite and classified under nematodes. Setariasis is caused by the migration of immature stages of setaria labiato-papillosa (S. digitata) and setaria equi. In sub-clinical stage lacrimation and conjunctivitis is seen followed by cloudiness of cornea resulting in corneal opacity. Similar lesions are seen in Thalizia infection also but the parasite is lies either under the conjunctiva or in the vitreous cavity of the eyeball [2]. The infection occurs in equines when infected mosquitoes feed around eyes and deposit the infective larvae there, which enter and migrate in the anterior chamber of the eye [3]. Damage to the eye is caused by the serrated cuticle of the worm and movement of larvae leads to corneal opacity [4]. Ocular setariasis is usually treated surgically either by paracentesis or by aspiration [5]. Surgical treatment has been advocated & found successful [6], though medical treatment has been reported [7]

ANAMNESIS

Owner reported that animal is having cloudy appearance in its left eye since three weeks, which is increasing day by day. The animal was attended by a veterinarian previously. During clinical examination, cloudiness was observed in the left eye and on close examination a thread-like larva was seen in the eye. Thereafter, the case was referred for surgical correction at VCC unit.

CLINICAL SIGNS

Important clinical signs noted at the time of presentation included a snake-like, whitish parasite moving swiftly in the aqueous humour of the left eye, photophobia, corneal opacity, blepharospasm, mild lacrimation and head tilt, moderate depression, stiff gait and moderate fever (40°C). Haematological data shows a decrease in erythrocyte (RBC) count, haemoglobin and haematocrit (PVC), together with leucocytosis and an accelerated erythrocyte sedimentation rate (ESR).

TREATEMENT

The animal was properly restrained in lateral recumbency under sedation by xylazine (1.1 mg/kg). Regional anesthesia was achieved by 2% lignocaine hydrochloride. A 10 ml disposable syringe with an 18-gauge needle was inserted into the anterior chamber of the affected eye at 12 o'clock position of the cornea about 5 mm away from the limbus. The parasite was then successfully removed from the eye by sucking along with aqueous humor. After the removal of the parasite, ointment Neosporin-H was applied over the eye 3-4 times a day for 1 week. No additional surgical procedure was done to relieve the blindness of the affected eye. The worm removed was 5.2 cm long (Fig.1) and was identified as Setaria spp. under light microscopic. Ivermectin was administered at 200 µg/kg to avoid recurrence. The animal recovered without complications and corneal opacity was cleared after 4 weeks after treatment.

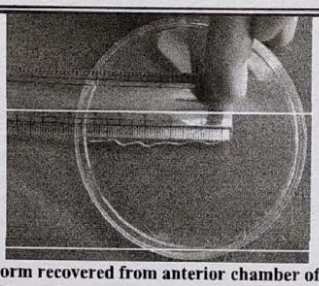


Fig.1: Eye worm recovered from anterior chamber of horse's eye

Results and Discussion

Setaria equina is found inside the anterior chamber of the horse's eye. This filaroidea nematode, which is normally found inside the peritoneal cavity of horses, may cause serious intraocular damage [8]. *Setaria equina* has an indirect life cycle. Microfilaria is transmitted by blood sucking insects. Larva of parasite arrives in the anterior segment of the eye and grows into immature adult. Clinical signs attributed to ocular fiariasis are caused by the resultant iridocyclitis which may be manifested by aqueous flare, hypopyon, photophobia, epiphora, miosis and corneal oedema as reported by Gangwar and coworkers [5]. Often the parasite cannot be visualised because of the opacity of the cornea and aqueous humour. Diagnosis and treatment Iridocyclitis of uncertain etiology in a horse merits a careful examination, with a focal light source and magnification, for the presence of intraocular parasites. If opaque media prevents a thorough intraocular examination symptomatic treatment for the uveitis may be instituted and the examination repeated. The treatment of choice for intraocular filariasis has been surgical removal of the parasite followed by treatment for uveitis. Although ivermectin has recently been reported to be 80 per cent effective against adult S equina at a dose of 0.2 mg/kg bwt and 88 per cent effective at a dose of 0.5 mg/kg bwt [9].

Conclusion

Setaria worm present into the anterior chamber of eye was successfully retrieve by using paracentesis technique without serious complications. After removal of worm, vision was found clear, corneal opacity was gradually reduced and eye was completely clear after 4 weeks.

References

Bhadwal MS, Sharma RK, Singh. Equine intraocular parasite, Centaur. 1998; 24 (3): 81-83.

Xue CN, Tian, Z Huang. "Thelazia callipaeda in human vitreous." Canadian Journal of Ophthalmology 2007; 42(6):884-885.

Soulsby E. Helminths, Arthropods and Protozoa of Domesticated Animals.BaillièreTinda, London. 1982; 1:316-319

Rafee MA, and Amarpa. Equine ocular setariasis and its management. Journal of Experimental Biology and Agricultural Sciences 2016; 4(Spl-4-EHIDZ): S-140-143.

Gangwar AK, Devi KS, Singh HN, Singh A. Ocular filariasis in equines. Indian Veterinary Journal. 2008; 85: 547-548.

Scanned with CamScanner

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

THREE DIMENSIONAL (3D) BIOPRINTING

Ravi Prakash Goyal[1], Yogendra Singh[1], Ranjeet Kumar[1], Kh. Sangeeta Devi[2], Anil Kumar Gangwar[3]

Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224 229, Ayodhya (UP)

Abstract

Bioprinting is a part of tissue engineering which is used for the development of three-dimensional (3D) tissue constructs by automated computer-aided deposition of living cells, extracellular matrix (ECM) components, and biochemical factors at a specified position with adequate numbers and right combinations [1, 2]. Bioprinting first came into existence in 2003. It is a 3D fabrication technology involving biological tissues, organs and cells for different medical and biotechnology applications. Due to the limited organ donors worldwide, scientists have started utilizing bioprinting technology for various areas of regenerative medicine to possibly cope up with organ-shortage gap. Three dimensional bioprinting is the utilization of 3D printing like techniques to combine cells, growth factors, and biomaterials to fabricate biomedical parts that maximally imitate natural tissue characteristics [3]. Three dimensional bioprinting is the process of creating cell patterns in a confined space using 3D-printing technologies, where cell function and viability are preserved within the printed construct. 3D printing enables design and manufacture of construct that are architecturally close to native tissue [4]. Day to day innovations leads to produce the desired tissue or organ through bioprinting of cells or extracellular matrix by depositing 3D gel layer by layer to. Also, 3D bioprinting has begun to incorporate the printing of scaffolds, [5]. These scaffolds can be used to regenerate joints and ligaments [6].

Introduction

Bioprinting is a part of tissue engineering which is used for the development of three-dimensional (3D) tissue constructs by automated computer-aided deposition of living cells, extracellular matrix (ECM) components, and biochemical factors at a specified position with adequate numbers and right combinations [1, 2]. Bioprinting first came into existence in 2003. It is a 3D fabrication technology involving biological tissues, organs and cells for different medical and biotechnology applications. Due to the limited organ donors worldwide, scientists have started utilizing bioprinting technology for various areas of regenerative medicine to possibly cope up with organ-shortage gap. Three dimensional bioprinting is the utilization of 3D printing like techniques to combine cells, growth factors, and biomaterials to fabricate biomedical parts that maximally imitate natural tissue characteristics [3]. Three dimensional bioprinting is the process of creating cell patterns in a confined space using 3D-printing technologies, where cell function and viability are preserved within the printed construct. 3D printing enables design and manufacture of construct that are architecturally close to native tissue [4]. Day to day innovations leads to produce the desired tissue or organ through bioprinting of cells or extracellular matrix by depositing 3D gel layer by layer to. Also, 3D bioprinting has begun to incorporate the printing of scaffolds, [5]. These scaffolds can be used to regenerate joints and ligaments [6].

THE BASICS OF BIO-PRINTING

Three-dimensional bio-printing generally follows three major steps viz. pre-bioprinting, bioprinting and post-bioprinting [7]. **Pre-bioprinting** is the process of creating a hypothetic model that the bioprinter will later create and choosing the desired materials that will be used. **Bioprinting** shares three basic concepts with an ordinary desktop printer–hardware, ink (bio-ink), and paper (biomaterials). Three major types of printers have been applied to the field of tissue engineering: inkjet, laser-assisted, and extrusion. The **post printing** process is important for the acquisition of a reliable 3D biological construct with appropriate mechanical integrity/strength and biological functionality as per need of the body.

TYPES OF BIO PRINTERS

Ink jet bioprinters:

This type of bio printing also known as 'Drop-on-demand printing' which is one of the inkjet printing technologies, enables the printing of complex and detailed sections of living tissues or organs on the culture substrates utilizing cells and/or biomaterials as bio-ink [8]. The inkjet printer makes use of nozzle that generates isolated droplets of cells laden material by means of piezoelectric or thermal actuation system. Acoustic waves or thermal forces, respectively, liquid drops are ejected onto a substrate. This method has the potential to accelerate the study of tissue bio fabrication [9]. Also, the skill of printing biomaterials is drawn upon drug delivery systems, which have also become an essential technique in tissue bio fabrication. This work presents the research trends in inkjet printing as a bio applicable technology, particularly in the fields of tissue engineering and drug delivery systems. The inkjet printing system ejects the ink droplets in large quantities, rapidly and uniformly. Thus, this property of the inkjet printing system is applied for fabricating various kinds of monodisperse microparticles [10].

Inkjet Bioprinting Technology for Pharmaceutical Applications:

Drug-loaded polymer microparticles with random shapes were manufactured by the inkjet printing system and printed four types of microparticles (circle, grid, honeycomb, and ring) using a mixture of PLGA, paclitaxel (PTX), and N, N-dimethylacetamide as bio-inks [11]. Creation of miconazole-coated microneedles for use in treating fungal infections is in use [9]. They fabricated the microneedle structures by dynamic mask micro stereo lithography and used the inkjet printing system to load miconazole into microneedles.

Limitation of Ink Jet Bio Printing:

There is a need to work with biological materials in liquid forms, which in most of the cases demand a fast polymerization procedure post printing. Nozzle clogs, when using solution with high cell densities and cell viability is one of the limitations of this technology [9]. Many drugs would be lost with pharmaceutical applications method.

Micro-Extrusion Printing:

It is a modification of inkjet printer. Extrusion-based printing is a pressure-driven technology. The extrusion material from micrometric aperture takes place. By continuous force, this technique allows to print incessant cylindrical line. The systems robotically extrude biological material by pneumatic or mechanical administration system onto a substrate. Almost all kind of hydrogels with changing viscosities can be printed with this approach. Compared to inkjet printers, micro-extrusion printing allows the deposition of the large number of cells generating construct with general tissue size [9]. It has limited application for certain soft tissue applications of small pore sizes [12]. Hard tissues with size larger than 10 mm also printed [13]. Cell viability reduced due to shear stress when cells are in viscous fluids during the extrusion.

The main advantage of extrusion bioprinting is the ability to print with very high cell densities [14]. The pressure used for the extrusion of the material has the potential to alter the cell morphology and function. This fabrication technique uses highly viscous hydrogel and does not necessarily require any chemical additives for the curing of printed structure [15]. Rheological behaviour of the hydrogel ink is very important for extrusion-based bioprinting. Hydrogels are mostly non-Newtonian fluids, meaning that their viscosity changes with shear rate.

Scanned with CamScanner

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EXTIRPATION OF EAR FIBROMA IN BUFFALO

A. K. Gangwar, Sangeeta Devi Khangembam and Mahesh Kumar Verma
Department of Veterinary Surgery and Radiology
College of Veterinary Science and Animal husbandry, Narenra Dev University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.)

Abstract

Fibroma is a benign tumour of mesenchymal origin and its occurrence as cutaneous fibroma is rare in cattle when compared to other cutaneous tumours like paillomas. A case of hard fibroma over the lateral aspect of ear pinna in a buffalo was managed successfully by radical surgery. Local analgesia was achieved by using xylazine @ 0.05 mg/kg BW I/M and local infiltration of 2% lignocaine hydrochloride, respectively. After aseptic preparation of the site, two semicircular incisions were given around the base of the mass and growth was extirpated. Haematoxylin and Eosin (H&E) stained tissue section of tumour mass showed dense tissue of mature fibroblasts in collagenous stroma that oriented in different interlacing or parallel planes (Fig. 5). Fibrocytes were hyperchromatic having elongated fusiform nuclei with few mitotic figures at places. Based on the findings of the histopathology the mass was confirmed as fibroma.

Key words: Fibroma, Ear pinna, Buffalo, histopathology

Introduction

Neoplasm is an abnormal mass of tissue which is common in old age animals but can occur at any age of life with significant morbidity and mortality (Tyagi and Singh, 1993). Fibroma is a benign tumour of mesenchymal origin and its occurrence as cutaneous fibroma is rare in cattle when compared to other cutaneous tumours like paillomas. The fibromas can be found in different places of body especially on head, neck and shoulder (Gurram *et al.*, 2017). The cutaneous tumours may not always hinder the routine function of animal, but may depreciate the aesthetic appearance. The present paper reports a case of hard fibroma over the lateral aspect of ear pinna in a buffalo.

Materials and methods:

Case history and Clinical signs:

An 8 year old non-descript she buffalo was presented to the Surgery and Radiology unit of TVCC with a hanging hard mass on the lateral surface of left ear pinna (Fig.1). Detailed enquiry revealed the growth that was observed by the owner 6 months before which is gradually increasing in size. On clinical examination, it was measured about 5 inches in diameter at the time of presentation to the clinic. The tumor appeared as hard solitary ball like, painless movable swelling with skin covering. Appetite of the animal was normal and all physiological parameters were within normal limit.

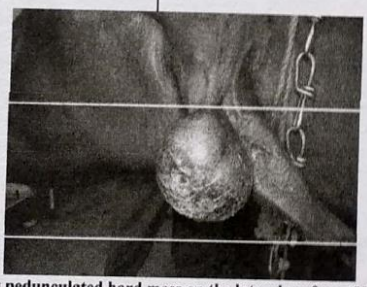


Fig.1: Buffalo showing pedunculated hard mass on the lateral surface of left ear pinna

Surgical treatment:

After 24 hours of fasting, sedation and local analgesia was achieved by using xylazine @ 0.05 mg/kg BW I/M and local infiltration of 2% lignocaine hydrochloride, respectively. After aseptic preparation of the site, two semicircular incisions were given around the base of the mass involving fresh skin and tissues. The mass was separated by blunt dissection sparing the major blood vessels of the ear pinna. Finally the growth was extirpated and subcutaneous sutures were applied with catgut no.1 using subcuticular suture pattern. Skin was closed by simple interrupted suture pattern using silk no. 2 (Fig.2). Postoperative care includes intramuscular injection of Intamox® (3 gram) and Melonex® (10 ml) for 5 and 3 days respectively. Antiseptic dressing was done with Betadine. Sutures were removed on 12th post-operative day. For histopathological examination, the tissue sample was preserved in 10% formal buffered saline.

Fig.2: Surgical closure of skin after extirpation of mass

Scanned with CamScanner

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

COMPARISON OF LIGNOCAINE AND ITS COMBINATION WITH KETAMINE FOR INTRAVENOUS REGIONAL ANESTHESIA IN CATTLE

Vipin Kumar Yadav, A. K. Gangwar*, Sangeeta Devi Khangembam, Shaurya Kumar, Rajesh Kumar Verma[1] and Rabindra Kumar[2]
Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Faizabad (UP)
[1] Department of Teaching Veterinary Clinical Complex
[2]Department of Veterinary Obstetrics and Gynaecology

Abstract

The present study was conducted on the bovine having different surgical ailments of hoof/digit. The bovines having foot disease(s) were divided in to two groups having six animals/limbs in each group. For intravenous regional anesthesia (IVRA), tourniquet was placed circumferentially at the middle of the metatarsus/ metacarpus. The anesthetic lignocaine @ 4 mg/kg b.wt. (group I) and, lignocaine @ 4 mg/kg b.wt. + ketamine @ 3.0 mg/kg b.wt. (group II) was injected in the radial vein. The anesthetic potency was monitored by observing the HR, PR, RR, Systolic pressure, Diastolic pressure, SPO2 and RT. In group I the heart rate increased significantly ($P < 0.05$) between 15 and 40 minutes and it significantly ($P < 0.05$) decreased in group II at 10 minutes interval. In group I pulse rate increased significantly ($P < 0.05$) at 20 minutes. Thereafter, the value decreased significantly ($P < 0.05$) at 60 minutes (68.00±1.15). However, no significant ($P > 0.05$) change in pulse rate was noted in group II animals at any time interval. There was no significant change in respiration rate in both groups. Respiration rate was significantly decreased after removal of tourniquet in group I animals. Peripheral oxygen saturation in group I significantly ($P < 0.05$) decreased at 15 minutes and increased significantly ($P < 0.05$) up to 60 minutes (89.66±0.80). In group II the value decreased significantly ($P < 0.05$) up to 60 minutes. Systolic pressure significantly increased at 15 and 20 minutes in group I animals. However in group II, systolic pressure increased at 60 minute interval. After removal of tourniquet, systolic pressure and diastolic pressure was significantly increased in group II. Sensory block onset time and motor block onset time was less in group II as compared to group I animals. Sensory block recovery time and motor block recovery time was longer in group II as compared to group I animals. It was concluded that lower IVRA technique was found suitable for hoof examination and surgery. Intravenous regional anesthesia was achieved more efficiently in group II as compared to group I animals. Postoperative analgesia was more in group II animals.

Key words: Claw surgery; IVRA; Ketamine

Introduction:

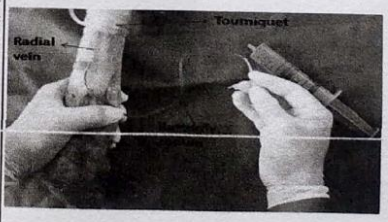
Anesthesia is defined as an irreversible loss of sensation in any part or whole body induced by anaesthetics or combination of preanesthetic and anesthetic that depresses the activity of nervous tissue. Local and regional anesthesia depresses the peripheral nervous tissue and general anesthesia depresses the central nervous system. Local and regional anesthesia is an integral part of large animal surgery because it is economic and easy to perform. Regional anesthesia is required to perform minor as well as major surgical interventions for correction of different surgical ailments. Intravenous regional anesthesia (IVRA) is induced in a part of the limb with intravenous injection of a local anesthetic into an extremity isolated from the rest of the systemic circulation with a tourniquet. It is an alternative method of general anesthesia for the patients at high risk (Mohr, 2006) and produces a rapid onset of anesthesia and skeletal muscle relaxation (Hassanein, 2016). The effect of anaesthesia disappears rapidly after tourniquet deflation. Intravenous regional anesthesia is safe for the patient having cardiovascular, respiratory or any other systemic disease. It is an ideal technique for operative procedures with anticipated duration of 60-90 minutes and success rates between 97-98% (Charath *et al.*, 2015). The ideal IVRA should have rapid onset, require less dose of local anesthetic (LA), reduce tourniquet pain, and prolonged postoperative analgesia. This may be achieved by addition of some adjuncts to LA (Bansal *et al.*, 2011).

Ketamine, a phenyl-piperidine derivative, is an intravenous anesthetic agent. At subanesthetic doses, it exerts a noncompetitive blockade of *N*-methyl-aspartate (NMDA) receptors. NMDA receptors play role in synaptic plasticity and are specifically involved in central nervous system facilitation of pain processing. NMDA receptor antagonists have been implicated in perioperative pain management (Elmetwaly *et al.*, 2010). Ketamine also has local anesthetic qualities, which have been studied as a sole agent for IVRA (Lauretti *et al.*, 1999). In addition to spinal cord NMDA receptors, have also been identified on peripheral unmyelinated sensory axons. This can explain why ketamine as an NMDA receptor antagonist was able to attenuate the tourniquet pain. Ketamine 0.5 and 0.3% produced adequate IVRA. Present study is under taken to evaluate the efficacy of intravenous regional anesthesia using lignocaine hydrochloride and its combination with ketamine in bovine.

Materials and methods

The present study was conducted on the bovine having different surgical ailments of hoof/digit. The bovines having claw disease(s) were divided in to two groups having six animals/limbs in each group. The animals were prepared as per routine surgical procedure. The affected animals were off fed for overnight and limb was shaved below the level of knee/ hock. No premedication was given to any of the animal. Animals were casted and restrained in lateral recumbency with affected limb upper most. The site was prepared aseptically and the area was painted with antiseptic solution. Intravenous regional anesthesia was induced as per the standard technique (Yavari *et al.*, 2017). Briefly, tourniquet was placed circumferentially in the middle of the metatarsus/ metacarpus (Fig. 1). Butterfly canula was placed in the radial vein and the area is exsanguinated.

Lignocaine hydrochloride alone @ 4mg/kg b.wt. was injected in group I animals. However, in group II animals, combination of Lignocaine hydrochloride (@ 4mg/kg b.wt.) and ketamine hydrochloride (@ 3mg/kg b.wt.) was injected in the radial vein (Fig. 1). After removing the needle, injection site was compressed with povidone iodine soaked cotton swab for about 1 minute to avoid unintended drainage of the local anaesthetic from the punctured vein or formation of a haematoma. The anesthetic potency was monitored by observing the following parameters:



Scanned with CamScanner

Distal Intravenous Regional Anaesthesia for Claw Diseases in Bovines

Shaurya Kumar, Sangeeta Devi Khangembam,
Anil Kumar Gangwar, Vipin Kumar Yadav, Rajesh Kumar Verma

10.18805/ijar.B-3815

ABSTRACT

The bovine having surgical ailments of claw, were divided in to two groups having six animals/limbs in each group. Tourniquet for standard and modified intravenous regional anesthesia (IVRA), was placed circumferentially at the middle of the metacarpus and just below dewclaw in group I and II, respectively. Lignocaine was injected @ 4 mg/kg and 2 mg/kg b.wt. in group I and group II animals, respectively. In group I, pulse rate increased significantly ($P < 0.05$) at 20 and 30 minutes. Heart rate increased significantly ($P < 0.05$) at 20 minute and 30 minute interval in group I and II animals, respectively. In animal of both groups, oxygen saturation significantly ($P < 0.05$) decreased during study time period. Systolic pressure significantly increased at 15, 20 and 20 minutes in group I animals. It was concluded that modified IVRA technique was safer as compared to standard IVRA.

Key words: Bovine, Claw diseases, IVRA, Lignocaine.

INTRODUCTION

Claw diseases are common in dairy cattle and can be treated in their early stages by therapeutic claw trimming (Thomas *et al.*, 2016). Intravenous regional analgesia is safe, reliable and cost-effective technique for providing anesthesia as well as bloodless short surgical procedures of extremities (Lumb and Jones, 1984). Bier's block can easily be used in field condition with minimum facility available. The disadvantages include local anesthetic (LA) toxicity, poor muscle relaxation, tourniquet pain and minimal postoperative analgesia (Muhammad and Muhammad, 2012). The ideal IVRA solution should have rapid onset, require less dose of local anesthetic (LA), reduce tourniquet pain and prolong post-deflation analgesia. This may be achieved by addition of adjuncts to LA (Kognole *et al.*, 2004). In presently available technique of IVRA, the tourniquet is placed at the mid metacarpal/ metatarsal region and large amount of local anesthetic is needed which sometimes may lead to local anesthetic toxicity during release of tourniquet (Skarda, 1987). Signs of toxicity can include drowsiness, minor convulsions and seizures, trembling and profuse salivation with hypotension (Weaver *et al.*, 2005).

To overcome this problem, dose of the local anesthetic can be reduced by applying tourniquet just below the dew claws. No study till date has been undertaken on lower IVRA in bovines. Due to the paucity of literature on this aspect, the current study is designed to compare the efficacy of different doses of lignocaine hydrochloride for standard IVRA with modified IVRA.

MATERIALS AND METHODS

The present study was conducted on the cattle having different surgical ailments of hoof/digit. The cattle having claw disease(s) were divided in to two groups having six animals/limbs in each group. The animals were prepared as per routine surgical procedure. The affected animals were off fed for overnight and limb was shaved below the level of knee/ hock. No premedication was given to any of the animal. Animals were casted and restrained in right lateral recumbency with affected limb upper most. The site was prepared aseptically and the area was painted with antiseptic solution. Intravenous regional anesthesia was induced as per the standard technique in group I animals (Yavari *et al.*, 2017). Briefly, tourniquet was placed circumferentially in the middle of the metacarpus (Fig 1). Butterfly canula was placed in the radial vein and the area was exsanguinated. However in group II animals, tourniquet was applied just below the dew claws and butterfly canula was placed in the axial digital vein (Fig 2). Lignocaine hydrochloride was injected @ 4mg/kg b.wt. and 2mg/kg b.wt. in group I and II animals, respectively. After removing the needle, injection site was compressed with povidone iodine soaked cotton swab for about 1 minute to avoid unintended drainage of the local

Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224 229 Ayodhya, Uttar Pradesh, India.

Corresponding Author: Anil Kumar Gangwar, Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Kumarganj-224 229 Ayodhya, Uttar Pradesh, India. Email: dranilvet2007@gmail.com

How to cite this article: Kumar, S., Khangembam, S.D., Gangwar, A.K., Yadav, V.K. and Verma, R.K. (2020). Distal Intravenous Regional Anaesthesia for Claw Diseases in Bovines. Indian Journal of Animal Research. 54(5): 614-618.

Submitted: 04-03-2019 **Accepted:** 20-01-2020 **Published:** 17-03-2020

Scanned with CamScanner

CONGENITAL UDDER AND TEAT ABNORMALITIES IN BUFFALOES

Anil Kumar Gangwar*, Kh. Sangeeta Devi, Ghanshyam Patel and Mahesh Kumar Verma

ABSTRACT

Three buffaloes with congenital athelia with amastia and polythelia with polymastia (presence of five and six functional quarters and teats) were placed on record.

Keywords: *Bubalus bubalis*, buffaloes, Athelia, amastia, polythelia, polymastia

INTRODUCTION

The udder of the buffalo is composed of four quarters each of which is a separate unit and is considered as an independent compartment. Supernumerary teats, fused teats, teat fistula, teat spider and imperforate teat are certain congenital conditions of teat (Tyagi and Singh, 1999). Genetic and environmental factors are responsible for these congenital defects. The presence of congenital athelia with amastia and polythelia with polymastia is rare in buffaloes. Congenital athelia with amastia has not been reported so for in this literature as for as our knowledge is concerned.

MATERIALS AND METHODS

Three buffaloes of age ranging between 4 to 6 years were presented to the Teaching Veterinary Clinical Complex for treatment of other disorders. These anomalies were recorded during close clinical examination. In one case, the anomaly was recorded during surgical correction of upward fixation of patella. During medial patellar desmotomy, it was seen that the udder of the animal have only two teats with one quarter in each half (Figure 1). After detailed enquiry it was recorded that her dam also had two teats.

The other two buffaloes were having five and six functional quarters and teats. The buffalo having five teats had three functional quarters in right half and two functional quarters in left half (Figure 2). However, the buffalo having six teats had three functional quarters in each half (Figure 3).

RESULTS AND DISCUSSION

Athelia and amastia is a very rare occurrence. Congenital mal-development of udder and teats could be an inherited trait as the anamnesis revealed that the dam of the presented animal

College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Faizabad, India, *E-mail: dranilvet2007@gmail.com

Scanned with CamScanner

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 15-20
© 2020 JEZS
Received: 07-01-2020
Accepted: 10-02-2020

Shaurya Kumar
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Anil Kumar Gangwar
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Sangeeta Devi Khangembam
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Rabindra Kumar
Department of Gynaecology & Obstetrics, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Vipin Kumar Yadav
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Ravi P Goyal
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Yogendra Singh
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Ranjeet Kumar
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Parvez Ahmed
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Rajesh Kumar Verma
Department of VCC, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP), India

Corresponding Author:
Anil Kumar Gangwar
Department of Veterinary Surgery and Radiology, C.V.Sc.& A.H., A.N.D.U.A. & T, Kumarganj, Ayodhya (UP)- India

Comparative evaluation of lignocaine hydrochloride alone and its combination with pentazocine lactate for intravenous regional anaesthesia in cattle

Shaurya Kumar, Anil Kumar Gangwar, Sangeeta Devi Khangembam, Rabindra Kumar, Vipin Kumar Yadav, Ravi P Goyal, Yogendra Singh, Ranjeet Kumar, Parvez Ahmed and Rajesh Kumar Verma

Abstract
The cattle having different surgical ailments of hoof/digit were divided in to two groups including 6 cattle in each group. Lignocaine hydrochloride (@ 4 mg/kg b.wt) and combination of lignocaine HCl + pentazocine lactate (4 mg/kg b.wt. + 1.0 mg/kg b.wt.) was injected in the radial vein in group I and II animals, respectively for inducing IVRA. In group I the HR and PR increased significantly ($P < 0.05$) at 20 minutes. The RR increased at 10 minutes in group I and between 30 and 60 minutes in group II. Oxygen saturation significantly ($P < 0.05$) decreased between 5, 10, 15, 20 and 30 minutes interval. Systolic pressure significantly increased between 15 and 30 minutes in group I animals. SBOT was less and SBRT was significantly ($P < 0.05$) more in group II as compared to group I. MBOT was similar in both group I and II animals. Efficacy of lignocaine in combination with pentazocine for producing IVRA was more as compared to lignocaine alone.

Keywords: Claw diseases, Lignocaine, IVRA, Bovine

Introduction

Distal limb and hoof/claw deformities such as fracture, interdigital fibroma, overgrown hoof, white line disease and sole ulcers are common disorders in cattle (Solano *et al.*, 2016) [18]. Claw trimming is the only method of treatment of early stages claw horn lesions (Thomas *et al.*, 2016) [20]. Cows with necrotic claw lesions represent a major welfare concern like chronic lameness for weeks and treatment of cases without necessary local anaesthesia. The more severe cases in which the inflammation and purulent infection reaches the pododerm, and inner structures of the horn shoe, leads to purulent arthritis of the coffin joint, osteomyelitis or necrosis of tendons and ligaments, amputation of claw or resection of the coffin joint under local anaesthesia (LA) is the only treatment of choice. Adequate pain relieving agents like lignocaine hydrochloride (2%) and non-steroidal anti-inflammatory drugs (NSAIDs) should be administered to control postoperative pain as claw surgeries are painful for diseased cattle (Janssen *et al.*, 2016) [10].

Intravenous regional analgesia is a safe and most commonly used technique with success rates between 97-98% (Charath *et al.*, 2014) [4]. Also this technique can be performed with minimum instruments and there is minimal bleeding at the surgical site (Reuben *et al.*, 2002) [16]. This technique provides analgesia of the limb or digits for short surgical procedures. Intravenous regional anesthesia is particularly advantageous to use in critically ill patients that are not fit for general anaesthesia. Being a regional technique it avoids all the complications of general anesthesia. It works through the retrograde diffusion of the local anaesthetic along and then out of the veins running adjacent to nerves within neurovascular bundles. Standard IVRA involves administration of 0.5% lidocaine solution. The disadvantages include local anesthetic (LA) toxicity, inadequate muscle relaxation, pain at the tourniquet site and minimal postoperative analgesia (Muhammad and Muhammad, 2012) [13]. Lignocaine remains the standard local anesthetic agent and most often used for IVRA. Advancement in the field of IVRA aimed at reducing the tourniquet pain increasing tourniquet tolerance improving the chances of intra operative and post-operative analgesia and decreasing the drug related adverse

Scanned with CamScanner

Cell Tissue Bank
https://doi.org/10.1007/s10561-021-09916-w

Decellularization of caprine esophagus using fruit pericarp extract of *Sapindus mukorossi*

Ravi Prakash Goyal · Anil Kumar Gangwar · Sangeeta Devi Khangembam · Vipin Kumar Yadav · Rabindra Kumar · Rajesh Kumar Verma · Naveen Kumar

Received: 15 January 2021 / Accepted: 10 March 2021
© The Author(s), under exclusive licence to Springer Nature B.V. 2021

Abstract Biological detergents like sodium deoxycholate, sodium dodecyl sulphate and Triton X-100 impairs the collagenous and non-collagenous proteins. glycosaminoglycans and growth factors. Further, certain chemical and enzymes are responsible for residual cytotoxicity in the decellularized extracellular matrix. The main focus of this study was to explore the decellularization property of soap nut pericarp extract (SPE) for development of decellularized tubular esophageal scaffold. For this 2.5, 5.0 and 10% concentrations of SPE were used for decellularization of caprine esophageal tissues. Histological analysis of hematoxylin and eosin and Masson's trichrome stained tissue samples confirmed decellularization with preservation of extracellular matrix microarchitecture. Scanning electron microscopic images of luminal surface of decellularized esophageal matrix showed randomly oriented collagen fibres with large interconnected pores and cells were absent. However, the external surface was more textured with fibrous structures and collagen fibres were well preserved. DAPI stained decellularized tissues revealed complete removal of nuclear components, verified by DNA content measurement and SDS-PAGE. The FTIR spectra of decellularized esophagus shows absorption peaks of amide A, B, I, II and III. Elastic modulus of the decellularized esophagus scaffolds increased ($P > 0.05$) as compared to native tissues. Histological and scanning electron microscopic evaluation of in vitro seeded scaffolds showed

R. P. Goyal · A. K. Gangwar (✉) · S. D. Khangembam · V. K. Yadav
Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224 229, India
e-mail: dranilvet2007@gmail.com

R. P. Goyal
e-mail: ravi28goyal@gmail.com

R. Kumar
Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224 229, India

R. K. Verma
Department of Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224 229, India

N. Kumar
Division of Surgery, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh 243122, India
e-mail: Naveen.ivri1961@gmail.com

Published online: 26 March 2021

Content courtesy of Springer Nature, terms of use apply.

Scanned with CamScanner

Micron 142 (2021) 102997

Contents lists available at ScienceDirect

Micron

journal homepage: www.elsevier.com/locate/micron

Development of decellularized aortic scaffold for regenerative medicine using *Sapindus mukorossi* fruit pericarp extract

Ravi Prakash Goyal [a], Sangeeta Devi Khangembam [a], Anil Kumar Gangwar [a,*], Mahesh Kumar Verma [a], Naveen Kumar [b], Parvez Ahmed [a], Vipin Kumar Yadav [a], Yogendra Singh [a], Rajesh Kumar Verma [c]

[a] Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya UP, 224 229, India
[b] Principal Scientist, Division of Surgery, I.V.R.I., Izatnagar UP, India
[c] Department of Veterinary Clinical Complex (Veterinary Microbiology), College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya UP, 224 229, India

ARTICLE INFO

Keywords:
Caprine aorta
Decellularization
Histology
SEM
Mechanical testing
DAPI staining

ABSTRACT

The aim of this study is to develop a novel decellularization method using aqueous extract of soap nut pericarp (SPE) and its evaluation using hematoxylin–eosin staining, scanning electron microscopy, diamidino-2-phenylindol (DAPI) staining, mechanical testing, sodium dodecyl sulfate polyacrylamide gel electrophoresis and DNA quantification. The presently available decellularization agent raises some concerns due to the potential for presence of residual cytotoxic agents in the extracellular matrix. Histological analysis of hematoxylin and eosin and masson's trichrome stained processed aortic samples shows complete decellularization with preservation of extracellular matrix microarchitecture at 120 h. Further, staining of tissue samples with DAPI demonstrates complete removal of DNA fragments. Quantitative evaluation of DNA in the decellularized aorta tissues demonstrated a significant ($P < 0.01$) decrease in DNA content as compared to native tissues. Collagen quantification assay indicate no significant ($P > 0.05$) difference in its content between native and decellularized caprine aorta. Tensile strength of the decellularized scaffolds decreased non-significantly ($P > 0.05$) when compared to native tissues. There was no significant ($P > 0.05$) difference in young's modulus of elasticity, stiffness and stretch ratio between native aortic tissues and decellularized aortic scaffolds. Histological and scanning electron microscopic examination of in vitro cultured scaffold demonstrated the cell viability and proliferation of primary chicken embryo fibroblasts. SPE treatment is thus capable of producing cytocompatible decellularized caprine aorta scaffold with preservation of extracellular matrix architecture for vascular tissue engineering and could be applied widely as one of the decellularization agent.

1. Introduction

The clinical cases of cardiovascular diseases are increasing day by day and need for the development of substitute vessels is quite obvious. Biological scaffolds constructed from decellularised xenogenic extracellular matrix (ECM) have emerged as promising biomaterials for replacing defective and/or diseased vasculature (Badylak et al., 2009). Tissue decellularization is the process of removal of cellular components to produce acellular extracellular matrix (ECM). Decellularization techniques are classified by chemicals used, such as acid or alkaline treatment, biological detergent treatment, or enzymaic digestion and the physical methods. Chemical and/or enzymatic treatment is concerned with the use of chemical reagents like sodium deoxycholate (Gangwar et al., 2013), Triton X-100 and DNase (Gangwar et al., 2006). These detergents may damage collagenous and non-collagenous proteins, GAGs and growth factors. The use of chemical and enzymatic agents raises some concerns due to the potential for the presence of residual cytotoxic agents in the decellularized ECM (Choi et al., 2012).

The fruit of *Sapindus mukorossi*, a member of the family Sapindaceae, contains 10.1 % saponins in the fruit pericarp. These saponins are

* Corresponding author at: Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya 224 229, Uttar Pradesh, India.
E-mail address: dranilvet2007@gmail.com (A.K. Gangwar).

https://doi.org/10.1016/j.micron.2020.102997
Received 12 October 2020; Received in revised form 11 December 2020; Accepted 14 December 2020
Available online 24 December 2020
0968-4328/© 2020 Elsevier Ltd. All rights reserved.

Scanned with CamScanner

Indian Journal of Animal Sciences **91** (4): 280–284, April 2021/Article

Development of novel intravenous regional anaesthetic technique for desensitization of hoof in cattle

VIPIN KUMAR YADAV[1], ANIL KUMAR GANGWAR[1]✉, SANGEETA DEVI KHANGEMBAM[1], RAVI PRAKASH GOYAL[1] and RABINDRA KUMAR[1]

Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh 224 229 India

Received: 24 September 2020; Accepted: 20 July 2021

ABSTRACT

The cattle having hoof diseases were selected in the study and divided into 2 groups having 6 animals in each group. For induction of intravenous regional anesthesia, tourniquet was placed circumferentially at the metacarpus and just below dewclaw in group 1 and 2, respectively. Mixture of lignocaine and ketamine (L+K) (4 mg/kg and 3 mg/kg b. wt.) was injected in the radial vein in group 1 animals. However, in group 2 animals the dose of L+K was halved (2 mg/kg and 1.5 mg/kg b. wt.) and injected in the dorsal common digital vein III. The anesthetic potency was monitored by observing the HR, PR, RR, systolic pressure, diastolic pressure and SPO_2. In group 1 the heart rate decreased significantly at 10 min interval. Peripheral oxygen saturation significantly decreased up to 60 min and 40 minutes in group 1 and 2 animals, respectively. Systolic pressure significantly increased at 60 minute interval in group 1 animals. After removal of tourniquet, systolic pressure and diastolic pressure was significantly increased in group 2. Sensory and motor block onset time was less in group 2 as compared to group 1. Sensory and motor block recovery time was long in group 2 as compared to group 1 animals. It was concluded that novel IVRA technique was more safe as compared to standard IVRA for the hoof anesthesia in cattle because low doses of local anesthetic are required in this technique with early sensory and motor block, and prolonged effect.

Keywords: Bovine, Hoof diseases, IVRA, Ketamine, Lignocaine

Local and regional anesthesia techniques are the integral part of large animal surgery for economy and practical point of view. Hoof diseases are very common in dairy cattle, especially in poorly managed livestock farm (Thomas *et al.* 2016). Intravenous regional analgesia is relatively safe and economic technique for inducing anesthesia as well as bloodless short duration surgical procedures of extremities (Lumb and Jones 1984). This technique can be utilized for the management of cattle hoof diseases in field condition with minimum available facilities (Kumar *et al.* 2020). The disadvantages of IVRA encompass local anesthetic toxicity, poor muscle relaxation, tourniquet pain and minimal postoperative analgesia (Muhammad and Muhammad 2012). The ideal IVRA solution should have rapid onset, require less dose of local anesthetic, reduce tourniquet pain, and prolong post-deflation analgesia. This can be attained by adding certain adjuncts to local anesthetics (Kognole *et al.* 2004). In standard IVRA technique, the tourniquet is applied at the metatarsal or metacarpal region and large amount of local anesthetic is required, which sometimes may lead to local anesthetic toxicity during release of tourniquet (Skarda 1987, Weaver *et al.* 2005).

Ketamine is a general anesthetic but it also has local anesthetic qualities, which have been studied as a sole agent for IVRA (Lauretti *et al.* 1999). Ketamine antagonizes the spinal cord N-methyl D-aspartate (NMDA) glutamate receptors. These receptors affect analgesia through peripheral mechanisms, including inhibition of peripheral C fibre neurons (MacIver and Tanelian 1993). In addition to spinal cord, NMDA receptors have also been found on peripheral unmyelinated sensory axons. Ketamine is a potent analgesic agent that possesses both central and peripheral sites of action (Pedersen *et al.* 1998).

We utilized peripheral application of ketamine as an adjunct to lignocaine for IVRA. Further, to investigate the problem of local anaesthetic toxicity, dose of the local anesthetic was reduced using modified IVRA technique. No study till date has been undertaken on lower IVRA in bovines. Due to the paucity of literature on this aspect, the current study is designed to compare the efficacy of standard IVRA with modified IVRA using ketamine as an adjunct to lignocaine hydrochloride.

MATERIALS AND METHODS

The cattle having surgical conditions of hoof of forelimbs were included in the present study. The animals were

Present address: [1]College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh. Corresponding author email: dranilvet2007@gmail.com

Scanned with CamScanner

MODIFIED INTRAVENOUS REGIONAL ANAESTHESIA FOR MANAGEMENT OF CLAW DISEASES IN BUFFALO

Yogendra Singh[1], Anil Kumar Gangwar[1,*], Sangeeta Devi Khangembam[1], Vipin Kumar Yadav[1], Ravi Prakash Goyal[1], Parvez Ahmad[1], Ranjeet Kumar[1], Rabindra Kumar[2] and Rajesh Kumar Verma[3]

ABSTRACT

In the present study, the buffalo having surgical affections of claw were divided randomly in to two groups having six animals in each group. Tourniquet was placed circumferentially at the middle of the metacarpus in Group I (standard IVRA) and just below dewclaw in Group II (modified IVRA) animals. In Group I animals, lignocaine hydrochloride and dexmedetomidine mixture was injected 4 mg/kg and 5 µg/kg b.wt in the radial vein. However, in Group II above drugs were injected in half doses in the axial digital vein. Heart rate and respiration rate decreased significantly in both group of animals. In Group I pulse rate decreased significantly ($P<0.05$). After removal of tourniquet no significant changes in HR, PR and RR was observed in both groups of animals. Peripheral oxygen saturation (%) decreased significantly in both groups of animals even after removal of tourniquet. Systolic and diastolic pressure significantly ($P<0.05$) decreased in both group of animals. Mean arterial pressure decreased significantly ($P<0.05$) in both groups at 5 and 10 minutes interval. In Group II animals, the value increased significantly at 20 and 40 minutes interval. Sensory and motor block onset time was lower in Group II as compared to Group I animals. SBRT was more in Group II animals and MBRT was more or less similar in both groups. None of the animal of both group showed sign of toxicity except stumbling in 4 animals of group I just after release of tourniquet.

Keywords: *Bubalus bubalis*, buffaloes, hoof disorders, lignocaine, dexmedetomidine, modified IVRA

INTRODUCTION

The ruminants are unsuitable subjects for the routine general anesthesia because of various complications associated with administration of general anesthesia *viz.* tympany, regurgitation, aspiration of ruminal contents, bed sore, radial nerve paralysis, etc. Further, facilities of general

[1]Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Ayodhya, India, *E-mail: dranilvet2007@gmail.com

[2]Department of Veterinary Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Ayodhya, India

[3]Department of Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Narendra Deva University of Agriculture and Technology, Ayodhya, India

Scanned with CamScanner

LIP-16 A review on symptoms and transmission of COVID-19 along with Immunodiagnostic approaches

V. Yadav[1], R.K. Joshi[2] and R.P. Diwakar[1]

Department of Veterinary Microbiology, C.V.Sc. & A.H., ANDUAT, Kumarganj 224229, Ayodhya (UP)
E-mail: vibhavet2005@gmail.com

The corona virus disease 19 (COVID-19) is a highly transmissible and pathogenic viral infection caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), which emerged in Wuhan, China and spread around the globe. SARS-CoV-2 is a large positive-sense single-stranded ribonucleic acid (RNA) virus that comprises of four structural proteins, i.e., nucleocapsid protein (NP) which holds the viral RNA while, spike protein (SP), envelope protein (EP), and membrane protein (MP), make the viral envelope. A characteristic of corona viruses (CoVs), the crown-like appearance is due to presence of the spikes having a diameter of 50-200 nm and length up to 20 nm on the surfaces (Chan *et al.*, 2020). WHO declared COVID-19 as a public health emergency of international concern (PHEIC) on January 30, 2020 and a pandemic on March 11, 2020. It exhibits a range of clinical manifestations, from mild flu-like symptoms viz. running nose, sneezing, coughing, fever, sore throat, and loss of smell to life-threatening conditions dyspnoea due to lung congestion (CDC, 2020). The transmission directly occurs by coughing, sneezing and without covering the mouth from infected person when droplets containing virus come into the air is inspirated by healthy person. The droplets containing virus when dropped on surfaces like clothes, furniture's, floor and fomites indirectly come in contact by touching them a healthy person get infection and further can pass the virus between individuals. The intermediate source of origin and transfer to humans is not known, however, the rapid human to human transfer has been confirmed widely (Zhou P *et al.*, 2020; Perlman S, 2020; Benvenuto D *et al.*, 2020).

To check the spread of COVID-19 it is of immense importance to identify asymptomatic cases that cause the spread of the virus on close contacts. At present commercially available COVID-19 tests fall into two major categories. The first category includes molecular assays for detection of SARS-CoV-2 viral RNA based techniques like polymerase chain reaction (PCR) or nucleic acid hybridization. The second category includes serological and immunological assays that used to detect antibodies produced by individuals as a result of exposure to the virus or detection of antigenic proteins in infected persons. The early development of diagnostic technology is always essential in any epidemic preparedness strategic plan (Peeling *et al.*, 2019).

Structure of SARS-CoV-2

The structure of SARS-CoV-2 comprises of spikes, which are formed by the spike glycoprotein (S) (Fig. 1). S is a major glycoprotein (Mol. Wt. ~180 kDa) that consists of two subunits, i.e., S1 and S2 (Li *et al.*, 2020). S1 contains a receptor binding domain (RBD), which is responsible for recognizing and binding with the host cell receptor, i.e., angiotensin converting enzyme 2 receptor (ACE2) found in the lower respiratory tract (Xie *et al.*, 2020). On the other hand, S2 contains other basic elements needed for the membrane fusion. S is the common target for neutralizing antibodies and vaccines, while the amino-terminal S1 subunit of S is the most variable immunogenic antigen. Additionally, SARS-CoV-2 has nucleoprotein (N) (Mol. Wt. ~40 kDa), the most abundant viral phospho protein produced and shed during infection. The template mRNA of N is the most abundant subgenomic RNA. Nucleoprotein exhibits high immunogenicity and can be detected in either serum or urine samples during the first two weeks of infection with peak viral shedding around ten days after infection (Paules *et al.*, 2020). Being a large protein, it can be detected via a sandwich immunoassay.

Furthermore, SARS-CoV-2 contains membrane protein (M), which is the most abundant protein on the complete virion particle. The envelope small membrane protein (E) is the smallest major structural protein of SARS-CoV-2, which is involved in viral assembly, release of virions, and pathogenesis.

Symptoms

Signs and symptoms of COVID-19 may appear 2 to 14 days after exposure which include fever, cough and shortness of breath or difficulty in breathing. Other symptoms can include tiredness, aches, runny nose, sore throat, headache, diarrhoea, vomiting and some people have experienced the loss of

Scanned by CamScanner

METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS IN ANIMALS*: A REVIEW

Vibha Yadav, Shivendra Pratap Singh, Sandeep Yadav, R.P Diwakar, Ashwani Kumar Gautam

Department of Veterinary Microbioligy
College of Veterinary Science and Animal Husbandry
N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P)- 224229

INTRODUCTION :

Staphylococcus aureus is a opportunistic pathogen of significant importance because of its ability to cause a wide range of diseases and capacity to adopt to diverse environmental forms (Lowy, 1998; Waldvogel, 2000). The organism colonises skin, skin glands and mucous membrane, causing infections both in human and animals such as rashes, inflammations of bones and the meninges as well as septicaemia (Aklilu et al., 2010). One reason for the continuing important role of *S. aureus* in disease is its propensity to become resistant to antimicrobials. *Staphylococcus aureus* has the characteristic ability to rapidly develop resistance to virtually any antibiotic coming into clinical use (Pantosti *et al*., 2007). Penicillin and its derivatives, including methicillin have been used for the treatments of infections caused by *S. aureus* (Rayner and Munckhof, 2005). However, certain strains of *S. aureus* developed resistance known as Methicillin resistant *Staphylococcus aureus* (MRSA).

Mechanism of resistance:

Methicillin resistance is due to the acquisition of *mecA* gene, that encodes new protein designated PBP2a, belonging to the family of enzymes necessary in building the bacterial cell wall. The protein (PBP2a) has a very low affinity for β-lactams antibiotics and confers resistance to Methicillin and the other beta-lactams (Pantosti *et al*., 2007). A new methicillin resistance mechanism gene, *mec*C was described in *S. aureus* (Porrero et al., 2014). García-Álvarez et al. (2011), Paterson et al. (2012), Walther et al. (2012) and Paterson et al. (2014) reported MRSA isolates carrying *mec*C gene from humans and animals.

Types Of MRSA:

There are two types of MRSA : Hospital acuired and community acquired.Hospital- and community-acquired MRSA, which occur in different populations, tend to cause different types of infections. Hospital-acquired MRSA can cause a wide variety of infections, from surgical site infections to invasive disease. These strains are major causes of nosocomial infections associated with indwelling medical devices and surgical site.

Human community-acquired-MRSA infections are mainly associated with superficial skin or soft tissue disease. Some community-acquired MRSA strains have caused other types of illnesses, including severe sepsis, necrotizing fasciitis and necrotizing pneumonia. Community-acquired strains can also occur in hospitalized populations

Historical perspectives of MRSA

The history of Methicilin resistant *Staphylococcus aureus* (MRSA) started with the development of antibiotics.Penicillin was discovered in 1928 by Alexander Fleming and quickly put into production. The 1940s saw penicillin being commonly used to treat a number of different infections. It also spawned the development of other antibiotics, like streptomycin, erythromycin, tetracycline and amoxicillin. Over time and use, the Staphylococcus bacteria naturally developed resistance to this drug, primarily due to the adaptive nature of the bacteria and the rampant overuse of the antibiotics in their early stages. Penicillin was used in the 1940s to

(89)

TATUS OF ANTIMICROBIAL RESISTANCE IN EXTENDED-SPECTRUM B-LACTAMASE PRODUCING *E. COLI AND KLEBSIELLA SPP.* OF BOVINE ORIGIN AND ITS PUBLIC HEALTH CONSEQUENCES.

R. K. Joshi, V. Yadav[1], N. Joshi[2] and S.V. Singh[3]

Dean , College of Veterinary Scince & A.H.

1. Assistant Professor, Department of Veterinary Microbiology;

Professor & Head, Department of Veterinary Microbiology; 3. Assistant Professor, Department of Veterinary Medicine,

ge of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, 224229, Ayodhya (U.P.), India.

duction:

timicrobial resistance (AMR) now a days is becoming a global problem and ing to rise in mortality and cost of treatment (Singla et al., 2014). AMR is defined as ce to antimicrobial drugs to which the microorganism was found sensitive. robial resistant bacteria in animal husbandry are directly related with these drugs is expanding throughout the world and have become a major problem in both veterinary n medicine (Baron et al., 2014). Antibiotics are widely used in animals as well as to fight with bacterial infections. However, their inappropriate use (use of broad s antibiotics at insufficient doses and unprofessional choice of antibiotics without to an antibiogram) or even their inexpedient use lead to the emergence of multidrug MDR) bacteria which limit the treatment options. India is the largest consumer of bial drugs in the world with 13 billion standard units in 2010 (CDDEP, 2015). The list ritical antimicrobial resistant microorganism (ARMs) has been published by the alth Organization (WHO) against which new antibiotics need to be developed WHO, 2017).

tam antibiotics are among the largest antimicrobial class used for treatment of fections world-wide. It is the most commonly prescribed antibiotics against serious both human and animals in India. These antibiotics include penicillin derivatives, ins and monobactams like aztreonam and carbapenem derivatives. Extended-lactamases (ESBLs) are an enzyme that hydrolyses most of the β-lactam and thus confers resistance against penicillins, 3rd and 4th generation

REVIEW ON LISTERIOSIS A ZOONOSIS AND ITS PUBLIC HEALTH IMPORTANCE

Vibha Yadav[1]*, Rajesh Kumar Verma[2], R.P. Diwkar[3] and Niyogi D[4].

1&3 Assistant Professor, Department of Vety.Microbiology,C.V.Sc.&A.H. NDUAT,Kumarganj,Faizabad-224229,U.P.,India

2 Assistant Professor,Department of Teaching Vety Clinical Complex,C.V.Sc.& A.H. NDUAT,Kumarganj,Faizabad-224229,U.P.,India

4Associate Professor,Department of Vety Pathology,C.V.Sc.& A.H. .NDUAT,Kumarganj,Faizabad-224229,U.P.,India

*Corresponding author

Introduction

Listeriosis is known by various names viz. circling disease, silage sickness, leukocytosis, cheese sickness, tiger river disease by Veterinarians, medical doctors and people involved in food science. Gustav Hülphers discovered this bacterial strains for the first time and named bacillus hepatis which later become popular as Listeria monocytogenes (Hülphers, 1911; McLauchlin, 2004; Hülphers, 2004). After one and half decade Murray et al. (1926) also identified bacteria identical to Listeria monocytogenes, which caused monocytosis in rabbit and guinea pig. That's why Murray is credited as first person to find out Listeria. This disease lacks its true definition of zoonosis because of involvement of an inanimate reservoir (food) as the major cause of listeriosis. Till sixties of twentieth century Listeria monocytogenes was regarded as the single species of genus Listeria but later other species have been identified. Listeriosis is of utmost importance regarding public health because of its high mortality (20 to 30%) and due to high epidemic potential. This has high ability to survive in a wide range of temperatures and to make biofilms on various environmental surfaces, which serve as natural habitats or reservoirs in food hygiene (Duggan and Phillips, 1998). Transmission may happen directly especially among veterinarians, performing gynecological interventions with aborted animals.

It was a belief that Listeriosis is caused by direct transmission from animals to humans but it has been established that animals may be diseased or asymptomatic carriers of Listeria monocytogenes shedding the organism in their faeces. Now it is a general consideration that ingestion is the main mode of infection and food being the main vehicle of infection. A food related listeriosis outbreak was found in the Maritime Provinces of Canada (1981) which was not considered until the outbreak of California from January to August 1985 (James et al., 1985; Linnan et al., 1988) that food was recognized as an important vehicle of Listeria transmission. According to Mead et al. (1999) important vehicle of Listeria transmission is food in 99% of listeriosis cases. In medical physicians and other medical staff at risk are described as nosocomial infection. To understand the ecology including the zoonotic aspects is important in the prevention of transmission of Listeria monocytogenes.

Cultural characteristics

Listeria is aerobic and facultatively anaerobic. It has two forms S and R. On normal incubation after 24 hours, incubation colonies on nutrient agar are round, 0.5-1,5 mm in diameter, translucent, smooth, with glistening surface (S forms) while prolonged incubation makes colonies rough (R forms). Colonies show hemolytic activity on blood agar, which distinguishes Listeria monocytogenes from some other species of genus Listeria. Typical inverted "pine tree" like growth appears below 3 to 5 mm of the surface on semisolid medium. On sheep blood agar (5% v/v) Listeria monocytogenes exhibit positive CAMP reaction with Staphylococcus aureus but not with Rhodococcus equi.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 299-302

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 299-302
Journal homepage: http://www.ijcmas.com

Case Study

Ivermectin Toxicity Occurring in Pomeranian (Puppy) Male Dog: A Case Study

Prerit Kumar Singh[1*], Aprajita Johri[2], Mahesh Kumar Verma[2], R. P. Diwakar[3] and Vibha Yadav[3]

[1]Department of Veterinary Microbiology, N.D. University of Ag. & Tech., Kumarganj, Faizabad (U.P.), India
[2]Pratap Clinic of Veterinary and Veterinary Medicine Manipuri Uttar Pradesh, India
[3]Department of Veterinary Microbiology, C.V.Sc & A.H, Kumarganj Faizabad (U.P), India
Corresponding author

Keywords

Toxicity occurring in Pomeranian, puppy

A B S T R A C T

A 45 day old *Pomeranian male puppy weight 1.254 kg* was coming to pratap clinic of veterinary and veterinary medicine Manipuri Uttar Pradesh, for treatment. Earlier puppy was treated for tick infestation as per the owner told by given about 10mg of ivermectin tablet orally. Owner observed some clinical sign after 8 to 10 medication. Clinical examination revealed hypothermia (99.2˚F), tremors, ataxia, partial blindness, dilated pupil, weakness, incardination, no responsiveness, unable in defecation and behavioural changes. Therapeutic management was done by the administration of avil 0.5-1ml, neurokind 1-2ml,RL 20ml, NS 50ml, manitol 1-2ml/kg BW IV stat, vetacept 0.5ml/day repeated 6 hourly and dexamethasone @ 0.25-0.5mg/kg BW IM BID, rectal enema for passing feaces to withdrawal ivermectin on first day and with infusion of 20 ml dextrose (5%) IV. The dog recovered uneventfully after treatment.

Introduction

Ivermectin is a macrolide antibiotic produced from a fungus first isolated from a soil sample in Japan, *Streptomyces avermitilis*. The ivermectins are a class of chemicals that have a novel mode of action against nematode and arthropod parasites (Roder, 1998). Ivermectin is an antiparasitic drug belonging to the avermectin family of compounds. Ivermectin is a mixture of 80% or more of an analog of avermectin B1a and 20% or less of an analog of avermectin B1b. These compounds are 2 of 4 ivermectins produced by the actinomycete *Streptomyces avermitilis*. Although similar in structure to the macrocyclic lactones, ivermectins have no antibacterial or antifungal activity. They do have a broad spectrum of activity against nematode and arthropod parasites of both plants and animals (Campbell, 1983). All major gastrointestinal and lung nematodes and certain ectoparasites of cattle, sheep, horses and swine, intestinal nematodes, ear mites and sarcoptic mange of dogs, infective-stage heartworm and microfilariae of dogs, and certain intestinal nematodes of chickens are effectively eliminated by ivermectin (Roberson, 1988). Ivermectin is an agonist for the neurotransmitter gamma-

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

Management of traumatic proptosis in a pug: A case study

Sandeep Yadav, Vibha Yadav, RP Diwakar and Pramod Kumar

Abstract
A three years old male pug dog, weigh 10 kg was presented to Jai Pet Care Clinic Raebareli, Uttar Pradesh for treatment with unilateral traumatic proptosis. All clinical parameters were normal. Physical examination revealed partial prolapse of right eye globe with severe periorbital edema, haemorrhage, absence of menace and presence of miosis. Therapeutic management done by administration of triflupromazine @4mg/kg I/M for sedation, dexamethasone and gentamicine 0.2ml each in combination injected through intra palpebral route, which was repeated on 5th day. Animal was also given intramuscular injection of gentamicin @5mg/kg, dexamethasone @0.125mg/kg, vitamine B complex 2.0 ml and chlorpheniramine maleate @0.5mg/kg only once for 5 consecutive days. Eye drop of moxifloxacine and dexamethasone 4 times a day for instillation, chloramphenicol ointment 4 times a day for local application and enrofloxacin @5mg/kg orally once for 7 days were used. Animal recovered successfully after 7 days of regular treatment. Vision was assessed by simple vision testing using junction box, after 15 days of recovery and found normal.

Keywords: Pug, proptosis, therapeutic management

Introduction

Proptosis is forward displacement of globe which occur secondary to any blunt trauma to head [7]. Proptosis typically occurs in dogs following trauma to the face or head. Certain breeds of dog are more prone to eye proptosis than others because of their differences in facial conformation. The most common cause of proptosis in small breed dogs is a fight with a larger dog. During trauma, the globe is luxated from the orbit, and eyelid spasms prevent its retraction. Secondary orbital hemorrhage and swelling displace the globe further from the orbit following corneo-conjunctival drying and malacia [3]. Prognosis depends on pupil size and reflexes, duration of exposure, other globe or orbital damage, breed and other systemic trauma. Approximately 40–60% of dogs, but very few cats, recover vision. Traumatic proptosis can occur in any breed and in both dogs and cats. Only 20-40% of dogs that have the reattachment of the eyeball regain their vision.

Case history and observations

A three year old male pug of 10 kg weight was presented at Jai Pet Care Clinic Raebareli, Utter Pradesh with unilateral traumatic proptosis having recent history of blunt head trauma by hitting head against the wall. Clinical examination revealed partial prolapse of right eye globe (fig -1) through the pulpebral fissure with severe periorbital edema (fig.-2), haemorrhage without fracture of skull. There was absence of menace and presence of miosis. Corneal examination revealed concurrent finding of pigmentary vascular keratitis. All clinical parameters of the pug were normal.

An overview on antimicrobial resistance in Extended-spectrum β-lactamase producing E. coli and Klebsiella species of bovine origin and its zoonotic importance in present scenario

Vibha Yadav[1*], R. K. Joshi,[2] and Namita Joshi[3]
1.Asstt. Prof., 2.Prof.&Head, Deptt of Vety. Microbiology; 3.Prof.&Head, Deptt of VPH & Epidemiology; College of Veterinary Science & Animal Husbandry
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, 224229 Ayodhya (U.P.)

Abstract

Emergence of antimicrobial resistance in animal husbandry is of utmost concern as it has resulted in therapeutic failure. It is a complex phenomenon due to triangular interplay of the host, pathogens and antimicrobial agents. Nowadays resistance to antibiotics of ? -lactum groups expanding rapidly worldwide and threatening the public health care due to limited treatment options. However, their inappropriate use or even their unnecessary use leads to the development of multidrug resistant bacteria. Members of Enterobacteriaceae, are most commonly implicated food borne pathogens as they are generally commensal in GIT of human and animal. Among them Escherichia coli and Klebsiella pneumoneae strains have been found resistant to most of the common antimicrobials which may be alarming for human health. Resistance may be intrinsic, may be acquired through spontaneous mutations or may occur due to horizontal gene transfer. Due to horizontal gene transfer, even non-pathogenic microbial species may become pathogenic and serve as an ecological reservoir of resistant genes.

Introduction:

Today, antimicrobial resistance (AMR) has become a global issue, contributing to rise in mortality and cost of treatment. Antimicrobial resistance (AMR) is the resistance of a microorganism against an antimicrobial agent to which it was originally sensitive [1] (WHO, 2013). Dispersion of antibiotics is done at large scale, in India even sometimes without any proper prescription. Animal Husbandry is not untouched and antibiotics are used to a great extent, which needs enforcement of strict government rules and regulations for their use in field conditions [2]

Extended-spectrum ?-lactamases (ESBLs) are enzymes that hydrolyse most of the ?-lactam antibiotics and thus mediate resistance to penicillins, 3rd and 4th generation cephalosporins (Saravanan et al., 2018). Beta-lactamase inhibitors, inhibit these ESBLs such as clavulanic acid, sulbactam and tazobactam [3]. The genes encoding for these enzymes are commonly found both on the chromosomes and plasmids among Enterobacteriaceae family [4].

Among Enterobacteriacae, E. coli and Klebsiella species are main environmental pathogens associated with various illnesses such as acute bovine mastitis [5], pathogenic E. coli with diarrhoea and extra intestinal infections in humans and animals [6], K. pneumoniae with respiratory and urinary tract as well as bloodstream infections [7]. Resistance to extended-spectrum ?-lactams occurs mainly in members of Enterobacteriaceae family through plasmids encoded ESBL genes [8].

Antimicrobial resistance and modes of transmission:

Antimicrobial resistance (AMR) is not limited to only specific area but has also been considered as worldwide global health issue for both human and veterinary field. It is a complex phenomenon due to triangular interaction of the host, pathogens and antimicrobial agents. There is an estimate that up to 2050, approximately 10 million per year deaths will occur due to infections with resistant bacteria [9]. Development of antibiotic resistance in animal pathogens is due to use of antibiotics in agriculture and animal husbandry practices which has emerged as major threat for animal health and their welfare aspect [10]. Most of the time antibiotics are used in livestock at sub-therapeutic levels for growth promotion, prophylaxis and treatment. The development of AMR has been attributed with prolong and indiscriminate use of antimicrobials in food animal production and in the treatment of bacterial infections [11]. In U. K. a

Yadav V, et al., Adv Microb Res 2020, 4: 015
DOI: 10.24966/AMR-694X/100015

HERALD

HSOA Advances in Microbiology Research

Review Article

An Overview on Transmission of Diseases in Special Reference to COVID-19 and Potential Targets to Control this Pandemic

Vibha Yadav[1]*, Mrigendra Rajput[2], Raj Pal Diwakar[1] and Rajesh Kumar[3]

[1]*Department of Veterinary Microbiology, University of Agriculture & Technology, Ayodhya, India*

[2]*Department of Biological Sciences, Arkansas Tech University, Russellville, USA*

[3]*Department of Veterinary Gynaecology and Obstetrics, Kumarganj, Ayodhya, India*

Abstract

With its initial outbreak in China, the virus was referred as "coronavirus". WHO has named it "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2). It has been described as the successor to SARS-CoV-1 which is a positive-sense single-stranded RNA virus. The virus spreads mainly between people who are in close contact (less than two metres or six feet) through small droplets produced during coughing, sneezing, or talking. Infected people exhale the contaminated droplets which are then inhaled into the lungs, or settle on other non- infected people's faces his/her mucosae (mouth and nose) or conjunctiva (eyes) get exposed to potentially infective respiratory droplets to cause new infection. Organism may enter to human cells by binding to the receptor angiotensin converting enzyme 2 (ACE2). Research works are in progress to find potential targets to control the pandemic. To control and treat the virus various targets are under study and these targets range from modulating host cell receptor for the virus entry to generate an effective adaptive immune response.

Keywords: Angiotensin; Coronavirus; SARS-CoV-2

***Corresponding author:** Vibha Yadav, Department of Veterinary Microbiology, University of Agriculture & Technology, Kumarganj, Ayodhya - 224229, India, Tel: +91 9450423644; E-mail: vibhavet2005@gmail.com

Citation: Yadav V, Rajput M, Diwakar RP, Kumar R (2020) An Overview on Transmission of Diseases in Special Reference to COVID-19 and Potential Targets to Control this Pandemic. J Adv Microbiol Res 4: 015.

Received: September 11, 2020; **Accepted:** September 22, 2020; **Published:** September 30, 2020

Copyright: © 2020 Yadav V, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

In present scenario, the term Corona has become an appalling word, which is not limited to the single country or continent but has been pandemic. The World Health Organization (WHO) recommended initially in January 2020 as "2019 novel coronavirus" as per its guideline of 2015 [1-3]. Before it during the initial outbreak in Wuhan, China, the virus was commonly referred to as "coronavirus", "Wuhan coronavirus" or "Wuhan virus" [4,5]. On 11 February 2020, "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2) was adopted by the International Committee on Taxonomy of Viruses. The WHO sometimes refers to SARS-CoV-2 as "the COVID-19 virus" in public health communications to avoid confusion with the disease SARS and the name HCoV-19 was included in some research articles [6,7].

The National Institutes of Health has described it as the successor to SARS-CoV-1 (NIH, 2020) which is a positive-sense single-stranded RNA virus. It is contagious in nature to humans, and the World Health Organization (WHO) has designated the ongoing pandemic of COVID-19 a Public Health Emergency of International Concern [8].Taxonomically, SARS-CoV-2 is a strain of severe acute respiratory syndrome-related coronavirus (SARSr-CoV) [9]. It is found to have zoonotic origins and has close to genetic similarity of bat coronaviruses (approx 99%), it emerged from a bat-borne virus [10-12].There is no prove yet to link an intermediate animal reservoir, such as a pangolin, to its introduction to humans [13]. There is little genetic diversity in the virus, that indicates the spread of SARS-CoV-2 to humans which has occurred in late 2019.

Common symptoms are fever, cough, fatigue, shortness of breath, loss of smell and taste. Most of the cases result in mild symptoms, some leads to acute respiratory distress syndrome (ARDS) likely precipitated by a cytokine storm, multi-organ failure, septic shock, and blood clots (CDC, 2020). The incubation period is typically around five days but it may range from two - fourteen days [14]. If no members of the community are immune and no preventive measures have been taken then it has been estimated that each infection results in 1.4 to 3.9 new ones. The virus primarily spreads between people through close contact and via respiratory droplets produced from coughs and sneezes [15]. It mainly enters human cells by binding to the receptor angiotensin converting enzyme 2 (ACE2) [16].

Transmission of Infectious Diseases

Infectious diseases result due to invasion of host by a pathogenic agent. The continuous survival of infectious agents depends on their successful transmission to a susceptible host. Infection and replication of infectious agents is necessary to maintain the cycle of infection. Knowledge of life cycle of an infectious agent is essential for selecting the most applicable or approximate contact technology. There are horizontal and vertical two major modes of transmission of infectious diseases.

VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

LATEST TRENDS IN DEVELOPMENT OF ANTIVIRAL AGENTS: A REVIEW

Vibha Yadav[1*], Rajesh Kumar Verma[2], Rajesh Kumar Joshi[3] and Promod Kumar[4]
1.Asstt. Prof.,Department of Veterinary Microbiology
2.Asstt.Prof., Department of Teaching Veterinary Clinical Complex
3.Prof., Department of Veterinary Microbiology
4. Asstt.Prof., Department of Veterinary Physiology & Biochemistry
College of Veterinary Sciences & Animal Husbandry,N.D.U.A.&T.,Kumarganj, Ayodhya(U.P.)-224229

Abstract

History of infectious diseases as old as the human civilization, and need of protection against these infections has been always remain one of the prime concerns. Among all infectious agents, viruses are the most notorious, vibrant, active and important. In last ten years we have seen the emergence and identification of several new viral infections of global significance but have also been witnessed development of highly innovative new antiviral drug therapies. Earlier most commonly used antiviral agents are Acyclovir, Idoxuridine, Brivudine, Foscarnet, Zidovudin, Adamantane, Ribavirin and Interferons. In special reference to HIV, modern therapeutic pattern is Highly Active Retroviral Therapy in which combination of three or more antiviral agents are used. Several new and promising antiviral drugs have been approved viz. TLR agonists, Salivary micro-RNAs, Telbividin, Etravirine, Dolutegravir, Peramivir, Daclastavir and Ribavirin which allow better options to control various viral infections.

Introduction

"Prevention is better than cure" a slogan arises with the history of infectious diseases. It is as old as the human civilization and need of protection against these infections has been always remain one of the prime concerns. Infectious diseases are a leading cause of death, and alone accounted for one-fourth to one-third of total deaths worldwide. Among all the infectious agents, viruses are the most notorious, vibrant, active and important. Viruses are obligate parasites having DNA or RNA as their genetic material with markedly different mutation rates that can be quantified. Some viruses show remarkable genetic stability and others show variable rate of mutation. In the last three decades, several new viruses have been reported from all over the world and have caused major outbreaks (WHO report,2005). The first virus that was described was tobacco mosaic virus in 1892 by Dmitri Ivanovsky. Since then, about 5,000 viruses have been discovered and also there are many ways for the treatment of viral infection (Fraenkel and Wagner,1977). Viruses have many differences that characterize them from other microorganisms, as they contain only one type of nucleic acid (DNA or RNA), but never both of them simultaneously and also, they do not contain ribosomes or other cellular organelles. This is the reason why all viruses needed a host cell in order to multiply and outside of host cell they are inactive (Kornberg A, 1988). Meanwhile, we are struggling against viruses and lack foolproof antiviral therapies against them. For effective antivirales therapy, have to understand the genetic, molecular, structural as well as functional diversity of viruses, the intricacy of viral multiplication, immune escape, association of host cell machinery for replication and host immune response. Owing to such development, researchers were able to find out appropriate targets against viruses, and as a result many antiviral drugs have been developed.

In last ten years we have seen the emergence and identification of several new viral infections of global significance, (Satcher D,1988; Marston *et al*.,2014) but they have also witnessed the development of highly innovative new antiviral drug therapies, which have, for example, dramatically improved the prognosis of those infected with HIV (Hogg *et al*.,2008) and now are radically changing the care of those infected by hepatitis C (Sheridan C ,2014). However, concerns have been expressed about the increasing costs of developing new drugs and bringing them into clinical use (House of Commons, 2005, Mestre-Ferrandiz J *et al*.,2012, Scannell JW *et al*.,2012, Pammolli F *et al*.,2011, Hay M *et al*.,2014). Each virus affects only some cells (*e.g.* the HIV virus affects CD4+ T cells and macrophages). The multiplication cycle of viruses consists of four main parts. First is the entrance of the virus into the host-cell. Immediately after, the expression of viruse's genes, the multiplication of the nucleic acid and the synthesis of proteins follows. New virions are formed and released from the host-cell by cell lysis (Mycek MJ *et al*.,1999) or exocytosis.

Since 1960's many antiviral drugs have been discovered and gave us the opportunity to deal with many viral infections that we could not before. Most of them are efficiently used nowadays, while new substances are tested in order to produce newer, safer and more efficient drugs (Edwards RA and Rohwer F, 2005).

Traditional antivirals used in different infections

Herpetic infections

Herpetic infections are most common among human population and sometimes can lead to serious diseases, such as cancer. The cycle of herpes virus is characterized by activation and remission periods (Sheridan C, 2014). In the active period, virus-containing blisters are found and this situation can persist for several days, or sometimes, up to three weeks. During that period of time the virus becomes contagious and other people can be easily contaminated by direct skin contact or body fluids. On the other hand, in the remission period the virus stays in the sensory nerves of the central nervous system (CNS) without showing symptoms of infection (asymptomatic period). Following drugs are used in treatment of herpetic infection.

Acyclic Nucleosides:

Acyclovir: used as a selective inhibitor of herpes simplex virus (HSV) replication was an important breakthrough in the development of antiviral drugs. Its selectivity is based on a specific recognition by the HSV-encoded thymidine kinase. Gradually, the derivatives of acyclovir with improved properties have been developed (Scannell JW *et al*.,2012). **Ganciclovir** is effective also against Cytomegalovirus (CMV) infections (Pammolli F *et al*.,2011). **Valaciclovir** and **Valganciclovir** are prodrugs that are *in vivo* converted to the parent drug. **Penciclovir** is the active metabolite of the oral product (Hay M *et al*.,2014). Acyclovir is converted to acyclovir triphosphate by enzyme thymidine kinase and then it is incorporated into the viral DNA (Mycek MJ *et al*.,1999).

Nucleoside analogues:

Idoxuridine: is a nucleoside analogue used only topically for treatment of herpes simplex keratitis.

Trifluridine is used topically in the eye for treatment of herpetic infections (Hay M *et al*.,2014; Edwards RA and Rohwer F, 2005).

Varicella-Zoster virus infection

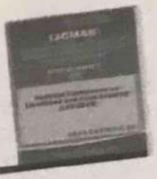
Primary infection caused by varicella-zoster virus (VZV) is manifested by varicella (chickenpox), while reactivation of latent virus causes herpes Zoster (shingles). In immunocompetent children,varicella is usually not a serious disease,but can cause severe morbidity and mortality in adults and in immunocompromised individuals.

Brivudine is an analogue of thymidine. Mechanism of action includes incorporation into the viral DNA and inhibition of viral replication by blocking the action of DNA polymerases (De Clercq E, 2004).

Vidarabine is a nucleoside analogue used systematically against varicella-zoster and herpes simplex infections. Mechanism of action

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 411-426

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 411-426
Journal homepage: http://www.ijcmas.com



Review Article

Review on Current Status of Infectious Bovine Rhinotrichitis in India

Vibha Yadav[1*], Shivendra Pratap Singh[1], Rajesh Kumar[2], R. P. Diwakar[1] and Pramod Kumar[3]

[1]Department of Vety. Microbiology, CVSc, NDUAT, Kumarganj, Faizabad 224229, U.P., India
[2]Department of Vety. Gynaecology & Obstetics, CVSc, NDUAT, Kumarganj, Faizabad 224229, U.P., India
[3]Department of Vety. Physiology and Biochemistry, CVSc, NDUAT, Kumarganj, Faizabad-224229, U.P., India
*Corresponding author

ABSTRACT

Livestock plays an important role in welfare of rural population of India and its economy. It contributes 9% of GDP and employs 8% labor force of the country. However respiratory and reproductive disorders in dairy animals due to various etiological agents have led to significant economic losses to dairy animals. The losses are due to abortions, metritis, retention of placenta, repeat breeding, death of animals, loss of production and trade restrictions etc. IBR caused by BoHV1, is a disease of domestic and wild cattle. BoHV1 is a member of the genus Varicellovirus in the subfamily Alphaherpesvirinae, family Herpesviridae and order Herpesvirales. Based on restriction endonuclease fingerprinting, BoHV1 is classified into three subtypes, namely, BoHV1.1, BoHV1.2a and BoHV1.2b. Most BoHV1.1 strains have been isolated from respiratory tract diseases or abortion cases and BoHV-1.2 strains from lesions of genital organs. Subtypes 1.1 and 1.2a have been associated with severe diseases including infection of the foetus and abortion and BoHV1.2b strains are generally involved in mild rhinitis or vaginitis. BoHV1 infection occurs in all continents and is responsible for the significant losses resulting from disease and trade restriction.

Introduction

Livestock plays an important role in welfare of rural population of India and its economy. It contributes 9% of GDP and employs 8% labor force of the country. However respiratory and reproductive disorders in dairy animals due to various etiological agents have led to significant economic losses to dairy animals. The losses are due to abortions, metritis, retention of placenta, repeat breeding, death of animals, loss of production and trade restrictions etc. IBR caused by BoHV1, is a disease of domestic and wild cattle. The first report of disease caused by BoHV1 was made as a venereal disease in a bull and contact cows (Ryehner, 1841) which was subsequently referred to as Blaschenausschlag in German literature. The viral aetiology of the disease was proved by Reisinger and Reimann (1928). The first published report on respiratory IBR came from Schroeder and Moys (1954) where they described an apparently new upper respiratory disease of dairy cattle that occurred in California in 1953. It appeared

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-III) : 2354-2357 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

OPPORTUNITIES AND CONTRIBUTION OF WOMEN TO LIVESTOCK SECTOR : A REVIEW

Vibha Yadav[1], Ravindra Kumar[2], and Pramod Kumar[3]

[1]Deptt. of Vety. Microbiology, [2]Deptt. of Vety. Gynaecology and Obstetrics, [3]Deptt.of Vety. Physiology and Biochemistry; College of Veterinary and Animal Sciences, Kumarganj, Faizabad U.P.

ABSTRACT

India is an agriculture based country and livestock sector in an integral component of it where, livestock production is largely in the hands of women. Livestock sector plays a significant role in the socio-economic development of India. Its growthis pro-poor and inclusive. Livestock helps in generating a continuous flow of income andemployment. The sector empowers women as they perform a large number of activities relatedto livestock production. According to the working group report on animal husbandry and dairying12th five year plan (2012-17), animal husbandry helps in improving gender equity. More thanthree-fourth of the labour requirement in livestock production is met by women. Most of the animal farmingactivities such as fodder collection, feeding, watering, and health care, management, milking and household-level processing, value addition and marketing are performed by women. The outstanding demand for livestock products gives considerable opportunitiesfor the rural women to escape poverty by diversifying livestock production. In this backdrop thestudy aims to highlight the role of Indian livestock sector in empowering rural women. It furtherestimates the contribution of animal husbandry vis-à-vis other agricultural activities in providingcasual, regular and self-employment to rural women.

Key words : *India, Livestock sector, Rural women.*

India is an agriculture based country and livestock sector is an integral component of it and livestock isgenerally considered a key asset for rural livelihoods. In India, livestock production is largely in the hands of women. In 2010-2011, livestock generated outputs worthRs. 2075 billion (at 2004-05 prices) which comprised 4% of Gross Domestic Product (GDP)and 26% of the agricultural GDP (PlanningCommission, 2012). Women play a major role in the livestock production activities in India. The female share in the agricultural labour force is case of India is about 30% (Sofa and Doss, 2011). About 70% of the agricultural workers, 80% of food producers, and 10% of those who process basic foodstuffs are women and they also undertake 60 to 90% of the rural marketing; thus making up more than two-thirdof the workforce in agricultural production (http://www.wikigender.org). Most of the animal farming activities suchas fodder collection, feeding, watering, and health care, management, milking and household-level processing, valueaddition and marketing are performed by women.The rapidly increasing demandfor livestock products creates opportunities for empowerment of women (Taneja, 2013). Therefore, there is a need tocorrect gender bias in livestock sector, veterinary education, research and service delivery systems as to enhance theeffectiveness of women-oriented livestock development programs (Anonymous, 2012-17).A women iseconomically empowered when she has both thecapacity to succeed and proceed economicallyand the power to make and act on economicdecisions (Golla *et al.*, 2011). Women play a veryimportant role in agriculture and on average theyconstitute 43% of agricultural labour force indeveloping countries (FAO, 2011). Out of 600 million rural poor of theworld who keep livestock two third are women(FAO, 2012b). Livestock are the largest non-landassets in rural asset portfolios. Livestock are thesignificant productive asset with high expectedreturns (Njuki, 2013). Livestock are the assetwhich can be easily owed by women and whichhave the potential to make contribution towardsthe reduction in the gender asset gap with inhousehold (Kristjanson *et al.*, 2010) and livestockoften is the single asset for rural women which isowned and controlled by them and which servesas an important source of income and cash forthem during the time of need (World Bank, 2009). In rural livestock based countries two thirdportion of low income livestock keepers areconstituted by rural women especially theactivities related to small livestock production(poultry, sheep, goats), milking and processingof milk are carried out primarily by women (Thornton, 2001; and FAO, 2011a).The importance of livestock for women'sincomes in developing countries has also beenwidely accentuated (Quisumbing *et al.*, 1995; andValdivia *et al.*, 1996). Dairy cooperatives havebeen chief means of bringing women in poorareas successfully into the cash economy in EastAfrica (Broken and Seyoum, 1992), India(Schneider, 1995) and Bolivia (Valdivia *et al.*,1996). Livestock sector gives a unique opportunityfor women to get empowered, however due tolack of awareness of the role that rural women play in livestock sector. In thisbackdrop the paper aims to highlight the opportunities to women in livestock sector as well as theircontribution in animal husbandryvis-

Bulletin of Environment, Pharmacology and Life Sci...
Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue [2] 2017: 391-394
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804
NAAS Rating 4.95

FULL LENGTH ARTICLE OPEN ACCESS

Climate change affecting animal health and production : A review

Vibha Yadav[1], Shivendra Pratap[2] and RajPal Diwakar[3]
1&3 Asstt.Prof. 2 MVScScholar, Deptt of VetyMicrobiology,NDUAT,Kumarganj,Faizabad U.P.

ABSTRACT

The threat perception of climate change is well known and its provoking impact is being noted at many levels. Various scientific reports of the Intergovernmental Panel on Climate Change (IPCC) indicate that climate change will impact the globe severely, and these impacts will vary depending on the region and on ecosystems. Animal production systems, climate change and animal health are inter-related via complex mechanisms. Direct exposure to climate change comprises changing weather patterns (increasing temperatures, more precipitation, rising sea-level and more frequent extreme events). Indirect exposure comprises changes in water, air and food quality, vector ecology and changes in ecosystems, agriculture, industry and settlements. Animal production influences climate change by emitting greenhouse gases such as methane and nitrous oxide. According to the IPCC, agricultural activities, including animal production, account for 10-12% of global emissions. This means that animal production offers major opportunities for reducing emissions, as well as for increasing the sequestration of greenhouse gases. But climate change in turn affects production (affecting nutrition, access to water and animal health). Animal health could be affected both by extreme events (for example high or low temperatures) and by the emergence and re-emergence of infectious diseases, some of them transmitted by vectors that are highly dependent on climatic conditions. In the case of the veterinary services of the countries, it will be necessary to build their capacity to handle the greater risks associated with climate change.
Key words: *climate change, livestock, animal production, animal health*

Received 12.07.2017 Revised 09.08.2017 Accepted 24.08.2017

INTRODUCTION

The scientific evidences point to climate change having an increasing impact on life on the planet. Average temperatures will rise, rainfall patterns will change, and extreme weather events such as storms, flooding, drought and heat waves will become more frequent and more intense. These processes are not something that will occur in the future however they are already happening. We are encountered to these phenomena on daily basis. Intergovernmental Panel on Climate Change (IPCC) for 2007 comprises an update on the state of knowledge of the associations between weather/climatic factors and public health outcomes for human populations concerned (Patz *et al.*, 2005). Within this framework, animal health as well as animal production will be particularly affected by climate change because it is so dependent on climate. The Intergovernmental Panel on Climate Change (IPCC) is sending out a clear message that human activities are contributing massively to global warming and to climate change. Economies, especially those of the most economically-developed countries, use large quantities of fossil fuels (oil, coal, natural gas), which generate very large quantities of greenhouse gases, in particular carbon dioxide, that contribute to climate change. In addition to carbon dioxide, human activities add methane and nitrous oxide to the atmosphere. These gases are generated in city landfills, livestock farms, rice fields and through the use of nitrogenous fertilizers. Some greenhouse gases are manufactured artificially, such as the fluorinated gases used in refrigeration and air-conditioning systems. Although methane and nitrous oxide have a potentially very powerful greenhouse gas effect, they have not been released into the atmosphere is such large quantities as CO_2, and their half life in the atmosphere is shorter. This means that CO_2 originating from human activities is the gas with the biggest impact on climate change. Animal production is a major component of food security. Through it we obtain products such as milk, eggs and meat, which are an intrinsic part of any global food security policy. Moreover, worldwide demand for these products is high and threatens to increase substantially in line with rises in population and average per-capita incomes. Raising livestock provides other non-food essential products, such as milk and

Haryana Vet. (December, 2021) 60(2), 208-212

Research Article

STATUS OF MULTIDRUG RESISTANCE AMONG ESBL PRODUCING *E. COLI* AND *KLEBSIELLA* SPP. ISOLATES OF BUFFALO ORIGIN IN EASTERN PLAIN ZONE OF UTTAR PRADESH

VIBHA YADAV*, R.K. JOSHI, NAMITA JOSHI[1], AMIT KUMAR[2] and SATYAVRAT SINGH[3]
Department of Veterinary Microbiology, [1]Department of Veterinary Public Health and Epidemiology, [3]Department of Veterinary Medicine, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, India
[2]Department of Immunology and Defence Mechanism, College of Biotechnology, S.V.P.U.A. & T. Meerut-250221, India

Received: 19.03.2021; Accepted: 22.07.2021

ABSTRACT

Extended-spectrum β-lactamase producing organisms are expanding rapidly throughout the world and have become a problem for both veterinary and human medicine. Among family Enterobacteriacae, *Escherichia coli* and *Klebsiella* are of major public health concern. In the present study, a total of 240 buffalo milk and faecal samples were collected from two districts of eastern plain zone of Uttar Pradesh (India). Total 59.58% isolates were identified including 53.33% *E. coli* and 6.25% *Klebsiella* spp. by PCR, out of which 41.25% isolates were confirmed as ESBL producers comprising 36.66% *E. coli* and 4.58% *Klebsiella* species by phenotypic confirmatory tests. All ESBL positive isolates were found 100% sensitive to aminoglycosides and polypeptide class of antibiotics and 100% resistant to 3rd generation cephalosporins and ampicillin. Out of total ESBL producers, 78.0% isolates were found multidrug resistant. The present study revealed predominance of ESBL as well as MDR in *Klebsiella* spp. as compared to *E. coli* and highlights a great threat for horizontal gene transfer.

Keywords: Antibiogram, Buffalo, *E. coli*, ESBLs, *Klebsiella*

How to cite: Yadav, V., Joshi, R.K., Joshi, N., Kumar, A. and Singh, S. (2021). Status of multidrug resistance among ESBL producing *E. coli* and *Klebsiella* spp. isolates of buffalo origin in eastern plain zone of Uttar Pradesh. *Haryana Vet.* **60(2)**: 208-212.

Today, antimicrobial resistance (AMR) has been a global problem contributing to rise in cost of treatment and mortality (Singla *et al.*, 2014). The problem of AMR is expanding rapidly throughout the world and has become a problem for both veterinary and human medicine (Reist *et al.*, 2013). Extended-spectrum β-lactamases (ESBLs) are enzymes that can hydrolyse most of the β-lactam antibiotics and thus mediate resistance to penicillins, 3rd and 4th generation cephalosporins (Saravanan *et al.*, 2018). ESBLs are most commonly detected among Enterobacteriaceae like *E. coli* and *Klebsiella* spp. Extensive use of antibiotics leads to the development of multidrug resistance (MDR) organisms. MDRs in Enterobacteriaceae is increasing day by day that lead to limited antimicrobial treatment options which are posing a treatment challenge, and a major cause of morbidity and mortality worldwide (WHO, 2016).

Due to paucity of data on ESBL and MDR index in Eastern Plain Zone of Uttar Pradesh, the present study focussed on the MDR pattern among ESBL producing *E. coli* and *Klebsiella* spp. isolates from milk and faecal samples of healthy and diseased buffaloes of eastern plain zone of Uttar Pradesh (India). It will help the researchers, field veterinarians and farmers in selection of antibiotics for therapeutic purpose.

MATERIALS AND METHODS

Sample collection : Total 240 samples (120 milk samples and 120 faecal samples) were collected between August 2019 to June 2020 from 5 tehsils of Ayodhya and 3 tehsils of Sultanpur district of Eastern Plain Zone of Uttar Pradesh, India. Samples were collected randomly from apparently healthy and clinically infected animals and sampling consisted of 10 normal and 5 mastitic milk samples from each of the tehsil. Likewise, 10 normal and 5 diarrhoeic faecal samples from above mentioned regions were collected. Collected samples were immediately transported to Veterinary Microbiology Laboratory under cold condition for further processing.

Isolation and Identification : Samples were enriched with 2 ml nutrient broth and incubated for 24 hrs at 37 °C. A loopful of inoculum was directly streaked on MacConkey agar (MLA) plates and incubated at 37 °C for 24 hr. Colonies showing rose pink colour were picked up and transferred to nutrient agar slant and incubated at 37 °C for 24 hrs. Thereafter, cultures were streaked on Eosine Methylene Blue (EMB) agar plates and colonies showing specific characteristics were identified by the method of Cruickshank *et al.* (1975). Further identification of the isolates was done using Gram's staining and standard biochemical tests, viz., IMViC pattern, catalase, nitrate reduction, urease, triple sugar iron agar and sugar fermentation as per method of Edward and Ewing (1972).

Extraction of genomic DNA : DNA templates were prepared by using snap-chill method as described by

*Corresponding author: vibhavet2005@gmail.com

Indian Journal of Animal Research

Detection and Molecular Characterization of Extended-spectrum β-lactamase Producing *E. coli* and *Klebsiella* spp. Isolates of Cattle Origin in Eastern Plain Zone of Uttar Pradesh

V. Yadav[1], R.K. Joshi[1], N. Joshi[2], Amit Kumar[3], S.V. Singh[4], D. Niyogi[5]

10.18805/IJAR.B-4762

ABSTRACT

Background: Antibiotics are widely used in animals and human for treatment without referring an antibiogram that resulted into the proliferation of ESBL producing strains. Nowadays resistance to β-lactam groups of antibiotic is expanding rapidly worldwide and threatening the public healthcare due to limited treatment options. Therefore this study aimed to detect ESBL resistance genes in *E. coli* and *Klebsiella* spp. isolated from various sources of cattle in this area of study.

Methods: Total 240 samples were collected during August, 2019 to June, 2020, from two districts of Eastern plain zone of Uttar Pradesh. *E. coli* and *Klebsiella* spp. isolates were confirmed using *uidA* and 16S *rRNA* gene respectively. *in vitro* antibiotic sensitivity test was performed using disc diffusion method. ESBL producing isolates was confirmed by DDST, ESBL E-strip and PCR analysis by targeting (bla-$_{CTX\text{-}M\text{-}1}$, bla-$_{CTX\text{-}M\text{-}9}$, bla-$_{TEM}$ and bla-$_{SHV}$) genes.

Result: PCR analysis of these isolates confirmed 135(56.25%) as *E. coli* and 16(6.67%) as *Klebsiella* spp. Antibiotics found to be most resistant were ampicillin (89.40%) followed by cefotaxime (72.18%), cefpodoxime (71.52%), ceftriaxone (66.9%), aztreonam (61.0%) and ceftazidime (54.30%). Total 101(66.88%) isolates were confirmed as ESBL producers using DDST and 92(60.92%) by ESBL E-strip test. ESBL genes were detected in 87(57.61%) isolates by PCR analysis and among them, bla-$_{CTX\text{-}M\text{-}1}$ was found most dominant gene.

Key words: Antibiogram, Cattle, *E. coli*, ESBL, *Klebsiella*.

INTRODUCTION

The emergence of antimicrobial resistance (AMR), especially among *Enterobacteriaceae* has been increasingly problematic and posses serious threat for both human and animal health (WHO, 2013). It is directly related with the use of these drugs in animal husbandry at insufficient doses and unprofessional choice which limit the treatment options. Resistant bacteria include both pathogenic and commensal organisms, with the later serving as a potential reservoir for mobile resistance elements (Khachatryan *et al*., 2004). Resistance among ESBL organism is mediated by enzyme Extended-spectrum β-lactamases (ESBLs) that hydrolyses most of the β-lactam antibiotics and mediates resistance against penicillins, 3rd and 4th generation cephalosporins (Saravanan *et al*., 2018). Among *Enterobacteriaceae, E. coli* and *Klebsiella* spp. are major ESBL producers and have been identified as global threat due to their increasing prevalence in livestock in last few years (Reuland *et al*., 2013). ESBL has been also reported in various niches as commensal in human, animals and environment. Such ecological niches may serve as reservoir and vehicle for transmission and dissemination in production animals due to their direct contact with food chain (Madec *et al*., 2017). Since no in depth study has been done on distribution of ESBL among cattle in this area of study and also their possible role in development of resistance to other species or pathogens. The present study will provide database to

[1]Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
[2]Department of Veterinary Public Health and Epidemiology, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
[3]Department of Immunology and Defense Mechanism, College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250 110, Uttar Pradesh, India.
[4]Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
[5]Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.

Corresponding Author: V. Yadav, Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
Email: vibhavet2005@gmail.com

How to cite this article: Yadav, V., Joshi, R.K., Joshi, N., Kumar, A., Singh, S.V. and Niyogi, D. (2022). Detection and Molecular Characterization of Extended-Spectrum β-lactamase Producing *E. coli* and *Klebsiella* spp. Isolates of Cattle Origin in Eastern Plain Zone of Uttar Pradesh. Indian Journal of Animal Research. DOI: 10.18805/IJAR.B-4762.

Submitted: 26-08-2021 **Accepted:** 27-12-2021 **Online:** 04-03-2022

B-4543
[1-8]

RESEARCH ARTICLE

Indian Journal of Animal Research

Detection of Carbapenemase Genes (bla_{-NDM}, bla_{-KPC}, $bla_{-OXA-48}$) in *Escherichia coli* and *Klebsiella* species, Isolated from Milk Samples of Bovine in Eastern Plain Zone of Uttar Pradesh

Vibha Yadav[1], Rajesh Kumar Joshi[1], Namita Joshi[2], Amit Kumar[3], Satyavrat Singh[4]

10.18805/IJAR.B-4543

ABSTRACT

Background: Among enterobacteria *E. coli* and *Klebsiella* spp. are of great concern in health care settings, as these bacteria sometimes may contaminate the milk due to unhygienic practices and poor udder condition which have been associated with various illnesses. Therefore, this study aimed to detect the carbapenem resistant *E. coli* and *Klebsiella* spp. of bovine milk origin with regard to the risk of human transfer via the food chain in community.

Methods: Total 240 samples were collected from Ayodhya and Sultanpur districts of Eastern Plain Zone of Uttar Pradesh (India). Confirmation of *E. coli* and *Klebsiella* spp. isolates was done by using species specific uidA and 16S rRNA gene, respectively. Then, carbapenemase positive *E. coli* and *Klebsiella* spp. were confirmend by DDST, MBL E-strip test and PCR analysis by targeting (bla_{-NDM}, $bla_{-OXA-48}$ and bla_{-KPC}). Antibiogram of all carbapenemase positive isolates was performed against 20 antibiotics of 12 different classes.

Result: In the present study, total 74(30.83%) isolates were identified including 55(22.92%) *E. coli* and 19(7.92%) *Klebsiella* spp. by PCR, out of which 12(16.21%) isolates were confirmed as carbapenemase producers comprising 7(12.72%) *E. coli* and 5(26.31%) *Klebsiella* spp by DDST and E-strip. All carbapenemase positive *E. coli* were found 100% sensitive to polymyxin-B and chloramphenicol, while all *Klebsiella* spp. were 100% sensitive to amikacin and polymyxin-B. Resistance against imipenem, meropenem, cefotaxime, cefpodoxime, ceftazidime, ceftriazone, aztreonam and ampicillin ranged between 80.0%-100%. All carbapenemase positive isolates were found multidrug resistant. Carbapenemase genes bla_{-NDM} and bla_{-KPC} were detected in *E. coli* while $bla_{-OXA-48}$ and bla_{-KPC} were detected in *Klebsiella* spp.

Key words: Carbapenemase, *E. coli*, *Klebsiella* spp., MBL-E test, Multidrug-resistance.

INTRODUCTION

Carbapenems are one of the most important groups of antimicrobials which are used as a last resort of antibiotics to combat the infection of multidrug resistant (MDR) pathogens. Unfortunately, the use of carbapenems has increased worldwide in past few years (Wang *et al.*, 2015), hence MDR and carbapenemase producing *Enterobacteriaceae* (CPE) have been increasing globally at a alarming rate. Resistance to carbapenem is generally mediated by various mechanisms such as loss of outer membrane porins, production of carbapenemase enzymes and over-expressed efflux pump. Majority of bacterial isolates that harbour these enzymes belong to *Enterobacteriacae*, because Gram negative bacteria producing ESBL enzyme led to higher carbepenem usage in human being which has resulted in the wider occurrence and spread of CPE (Muller *et al.*, 2018) in environment. The spread of these bacteria into many species may occur though sewage and waste water. Among *Enterobacteriacae*, *E. coli* and *Klebsiella* spp. are main environmental pathogens, associated with various illnesses and acute bovine mastitis (Koovapra, 2015). Resistant genes of these antibiotics are frequently located on mobile genetic elements which can be horizontally transferred (Ansari *et al.*, 2018) between the bacteria. CPE among livestock are of great

[1]Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry, ANDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
[2]Department of Veterinary Public Health and Epidemiology, College of Veterinary Science and Animal Husbandry, ANDUAT, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
[3]Department of Immunology and Defense Mechanism, College of Biotechnology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250 110, Uttar Pradesh, India.
[4]Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, ANDUAT, Kumarganj, 224229, Ayodhya, Uttar Pradesh, India.

Corresponding Author: Vibha Yadav, Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224 229, Ayodhya, Uttar Pradesh, India.
Email: vibhavet2005@gmail.com

How to cite this article: Yadav, V., Joshi, R.K., Joshi, N., Kumar, A. and Singh, S. (2021). Detection of Carbapenemase Genes (bla_{-NDM}, bla_{-KPC}, $bla_{-OXA-48}$) in *Escherichia coli* and *Klebsiella* species, Isolated from Milk Samples of Bovine in Eastern Plain Zone of Uttar Pradesh. Indian Journal of Animal Research. DOI: 10.18805/IJAR.B-4543.

Submitted: 26-05-2021 **Accepted:** 14-06-2021 **Online:** 04-08-2021

Isolation, Identification, Molecular Characterization and Antimicrobial Resistance Profiling of ESBL Positive *E. coli* Isolates of Cattle in Eastern Zone of Uttar Pradesh

Vibha Yadav[1*], Rajesh K. Joshi[2], Namita Joshi[3], Amit Kumar[4], Mrinal Srivastva[5], Satyavrat Singh[6], Pankaj K. Chaudhary[7]

Abstract

In this present study total of 240 milk and fecal samples were collected from two districts of the plain Eastern zone of Uttar Pradesh (India). Among 240 samples, a total of 135 (56.25%) isolates were confirmed as *E. coli* using a species-specific uidA gene oligonucleotide primer. Eighty-six (63.70%) ESBL producing *E. coli* isolates were recovered out of 135 isolates using confirmatory phenotypic methods. The antimicrobial resistance pattern revealed that all isolates showed (60-100%) resistance against cefotaxime, cefpodoxime, ceftriaxone, ampicillin, ceftazidime, aztreonam, etc. and 100% sensitivity against gentamicin, amikacin, chloramphenicol, and polymyxin-B. The multi-drug resistance (MDR) pattern of ESBL organisms was assessed by using the multiple antibiotic resistance (MAR) index. Out of 86 ESBL positive isolates, 70 (81.39%) *E. coli* was showed multi-drug resistance in the study. MAR index of these isolates was in the range from 0.25 to 0.75. The most frequently observed MAR index was 0.30 against 28 isolates. Antibiotic resistance patterns against non-β-lactam antibiotics were also observed, and 51 isolates showed resistance against both β-lactam and non-β-lactam antibiotics, while 19 isolates showed resistance against only β-lactam antibiotics of different groups.

Keywords: Antibiogram, Cattle, *E. coli*, ESBLs, MAR index, uidA gene.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.2.4

Introduction

Antimicrobial resistance (AMR) has been a global problem contributing to rise in mortality and cost of treatment. Antibiotics are widely used in animals and humans to fight bacterial infections. However, their indiscriminate use leads to the emergence of multidrug-resistant bacteria, limiting the treatment option (Saidani *et al.*, 2017). *E. coli* is the average inhabitant of the intestinal microbiota of animals and mammals and plays an essential role in host metabolism, immunology, and nutrition.

Production of Extended-spectrum β-lactamases (ESBLs) is the most common resistance mechanism to third-generation cephalosporins among Enterobacteriaceae, including E. coli *Klebsiella* species. β-lactams are the most commonly prescribed antibiotics against bacterial infections. The emergence of ESBL producing strains has limited the use of broad-spectrum cephalosporins in the management of serious infections caused by these pathogens, which results in therapeutic failures and a high mortality rate (Roy *et al.*, 2013).

Currently, there is a paucity of information on ESBL producing *E. coli* from animals in this region and their possible contributions to the development of resistance to other species or pathogens. Hence, surveillance-based study, antimicrobial resistance profiling, searching for an alternative antibiotic is the need of the hour to address the global issue of antimicrobial resistance. Hence, in this study, isolation, biochemical analysis, molecular characterization by uidA gene, detection of ESBL positive isolates by phenotypic methods, and antibiotic resistance profiling of ESBL positive

[1-2]Department of Veterinary Microbiology, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, UP, India.

[3]Department of Veterinary Public Health & Epidemiology, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, UP, India.

[4-5]Department of Immunology & Defense mechanism, College of Biotechnology, SVP University of Agriculture & Technology, Meerut-250110 (UP), India.

[6]Department of Veterinary Medicine, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, UP, India

[7]Department of Veterinary Physiology & Biochemistry, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, UP, India.

Corresponding Author: Vibha Yadav, Department of Veterinary Microbiology, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj-224229, Ayodhya, UP, India, e-mail: vibhavet2005@gmail.com

How to cite this article: Yadav, V., Joshi, R.K., Joshi, N., Kumar, A., Srivastva, M., Singh, S., Chaudhary, P.K. (2021). Isolation, Identification, Molecular Characterization and Antimicrobial Resistance Profiling of ESBL Positive *E. coli* Isolates of Cattle in Eastern Zone of Uttar Pradesh. Ind J Vet Sci and Biotech, 17(2): 18-24.

Source of support: Nil

Conflict of interest: None.

Submitted: 23/01/2021 **Accepted:** 15/05/2021 **Published:** 25/06/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

ISSUE XXVII, OCT 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

ANTIBIOGRAM STUDY OF ISOLATED BACTERIA FROM REPEAT BREEDING CATTLES IN PURVANCHAL REGION

Vibha Yadav[1], R.P.Diwakar[2], Pramod Kumar[3] Rajesh Kumar[4], Pankaj Kumar[5] and Umed Singh[6]

[1&2] Department of Veterinary Microbiology, C.V.Sc&A.H, Kumarganj
[3]Assistant Prof. Department of Veterinary Physiology& Biochemistry, C.V.Sc&A.H, Kumarganj
[4] Assistant Prof. Department of Veterinary Gynae& Obstract., C.V.Sc&A.H, Kumarganj
[5] Assistant Prof. Department of Vety. Public Health& Epidemiology,LUVAS, Haryana, India
[6] Department of Animal husbandry& Dairying,Haryana, India

(Received: 10.08.2018; Revised: 19.08.2018; Accepted: 23.08.2018)

(RESEARCH PAPER IN VETERINARY MICROBIOLOGY)

Abstract

The samples of cervical mucus of 21 crossbred and 20 Desi cows in and around the NDUAT Campus, Narendra nagar, Faizabad (Utter-Pradesh). The isolation of bacteria and in-vitro sensitivity pattern of various drugs against these isolates were carried out. The bacterial isolates comprised of Staphylococcus spp. Streptococcus spp. Pseudomonas spp. Anthracoids spp. E.coli, Corynaebacterium-spp. And some of the untyped Gram positive and Gram negative bacilli and coccobacilli among 14 crossbred and Desi cows with positive infection. Gentamicin was found effective in 92.9 per cent cases. The other drugs followed after Gentamicin in crossbred cows were ampicillin, Kenamycin and tetracycline in 28.6, 21.4 and 14.3 per cent cases respectively, whereas in desi cows other drug found effective were tetracycline, Kenamycin, Chloramphenicol, Streptomycin and ampicillin in 42.9, 42.9, 35.7,14.3 and 7.1 per cent cases respectively.

Introduction

Mainly buffalo is a triple purpose animal producing milk, meat and draught power. The country has made a grand specter on the World stage being top milk producer and leading meat exporter. The analysis shows that in 2015-16 nearly 36% of the milk production is contributed by Indigenous and 13% by non-descript buffaloes. The total buffalo meat production in 2015-16 was 1611 tones, which is 26% of total meat production in India. The buffalo population in Uttar Pradesh is 30625 thousand and in India it is 108702 thousand according to 19th Livestock Census. This particular livestock species has immense potential for poverty alleviation and rural entrepreneurship. However, just like any other successful agribusiness enterprises, buffalo farming too needs a highly dedicated scientific advisory system for decision making support.

The repeat breeding is the major problem responsible for poor productivity in cattle and buffaloes. It not only decreases the life time milk production but also increases the cost of milk production. A large number of micro-flora has been isolated from repeat breeder cattle and buffaloes in India. It is necessary to identify the micro-flora from cervical mucus of repeat breeders and to test in-vitro sensitivity pattern of these micro-flora prior to use of any antimicrobial agent in such animals.

Materials and Methods

A total of 41 (forty one) repeat breeder cattles in and around the NDUAT Campus, Narendra nagar, Faizabad (Utter-Pradesh). These cattles did not show any apparent illness in their reproductive organs but were not conceiving even after artificial insemination as well as natural service. The samples of cervical mucus was collected from these cattles aseptically and were inoculated on various media like blood agar (BA), Mac Conkey's lactose agar (MLA), Nutrient broth (NB) and Nutrient agar (NA) for primary isolation. The inoculated plates were incubated at 37^{0}C for 24 to 48 hours aerobically. The bacterial growth were obtained and tested against many antimicrobial agents for their in-vitro sensitivity and resistant pattern as per Cruickshank et al., (1975).

Results and Discussion

Out of 41 samples analysed for bacterial isolation 14 samples in crossbred (66.7%) and desi (70%) repeat breeder cattles were found positive for bacterial infection. Among animals positive for bacterial infection, 35.7 and 64.3% cases showed single and mixed infection, respectively in crossbred cows whereas 64.3 and 35.7% desi cows showed single and mixed infection respectively. The microorganisms isolated from cervical mucous of crossbred cows included untyped Gram negative bacilli (35.7%) untyped Gram negative coccobacilli (28.6%), *Staphylococus spp.* And *Pseudomonas spp.* (21.4% each), *E.coli*, untyped Gram positive bacilli, untyped Gram positives coccobacilli (14.3% each) and *Streptococcus spp., Anthrocoides spp.* And *Corynaebacterium spp.* (7.1% each). Untyped Gram negative bacilli and coccobacilli mainly affected the repeat breeder crossbred cows. On the other hand, the microorganisms isolated from cervical mucus of crossbred repeat breeder cows included *Pseudomonas spp.* And *E.coli* (42.9 %) *Anthrocoides spp.* (28.6%) *Staphyloccus spp.* And untyped Gram negative bacilli (14.3% each) and untyped Gram positive and Gram-negative coccobacilli (7.1% each). It reveals that *Pseudomonas* and *E.coli* were main source of infection among cross bred repeat breeder cows. Similar isolates were found by many scientists from cervical mucus of repeat breeder cows (Desmukh and Markandiya, 1995 and Singh et al., 1998).

The in-vitro drug sensitivity results indicated that Gentamicin was found effective in 92.9% cases of both crossbred and desi repeat breeder cows. Singh et al., (1998) reported percent sensitivity of Gentamicin whereas, Gupta et al., (1997) and Dessmukh and Markandiya, (1995) found sensitivity of Gentamicin against the isolates of Cervical mucus of repeat breeder cows as 94.1% and 91.3%, respectively, which is close agreement with the present findings. The other drugs which were found sensitive against the isolates of cervical mucus included Ampicillin (28.6%), Kanamycin (21.4%) and Tetracycline (14.3%) in crossbred cows and Kanamycin and Tetracycline (42.9% each), Chloramphenicol (35.7%), Streptomycin (14.3%) and Ampicillin (7.1%) in crossbred cows. It was observed that Streptomycin and Chloramphenicol were not found effective in any crossbred cow but their sensitivity in 14.3% and 35.7% cases respectively was recorded in crossbred cattle.

The results obtained by sensitivity test indicated that Gentamicin may be considered as drug of choice in for repeat breeder cows. The same results are recommended by Singh et al., (1998), Dessmukh and Markandiya, (1995) and Ramaswamy et al., (1991). However, it may further be stated that antibiotic sensitivity testing should periodically be carried out in order to rationalize the treatment against specific microorganism in specific locality.

Conclusion

The authors are thankful to the Dean, College of Veterinary Science & Animal Husbandry, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P) and also thank to Head of the Department of Veterinary Microbiology to providing necessary facility to carry out this research work.

References

Cruickshank, R., Duguid, J.P., Marmion, B. P. and Swain, R.H.A (1975). Medical Microbiology. 12th edn. Churchilla Livingstone Edinburg London & New York.

Deshmuck, V.V and Markandiya, N.M. (1995). A study on antibiotic sensitivity pattern of bacterial isolates from repeat breeding cows. *Indian J. Anim.Sci.*10: 337-338

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 403-410

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 403-410
Journal homepage: http://www.ijcmas.com

Original Research Article

Study of Multiple Drug Resistance in *Escherichia coli* strain of Poultry Origin

Vibha Yadav*, R. K. Joshi and R. P. Diwakar

Department of Veterinary Microbiology, College of Veterinary Science & Animal Husbandry, N.D. University of Agriculture & Tech., Kumarganj, Faizabad, India
**Corresponding author*

Keywords

Escherichia coli, antimicrobial, multiple drug resistance, poultry origin

ABSTRACT

In recent years *Escherichia coli* has emerged as a more problematic organism causing considerable losses worldwide due to increased susceptibility of birds. Resistance of E. coli to antibiotics is well known, which is a major obstacle in the control of infection. This problem is more vibrant in developing countries like ours due to uncontrolled use of antibiotics. Antimicrobial drug sensitivity of the isolates was tested for different antibiotics using the modified disc diffusion method. The antibiogram of seventy *Escherichia coli* isolates was studied against 12 antibiotics viz. ofloxacin, pefloxacin, ampicillin, amikacin, gentamicin, piperacillin, chloramphenicol, co-trimoxazole, tetracycline, cefotaxime, ceftizoxime and ciprofloxcin. Out of seventy *Escherichia coli* isolates tested, highest 69 (98.57 percent) isolates exhibited resistance against cefotaxime followed by 60 (85.71 percent) isolates showing resistance against piperacillin, 58 (82.86 percent) isolates showed resistance against tetracycline, 37 (52.86 percent) isolates were resistance to co-trimoxazole, 16 (22.86 percent) isolates were resistant to ceftizoxime, 14 (20 percent) isolates were resistant to pefloxacin, 11 (15.71 percent) isolates against ampicillin, 10 (14.26 percent) isolates showed resistance against ofloxacin and 7 (10 percent) isolates were resistant to ciprofloxcin and chloramphenicol both. Only one isolate (earch 1.43 percent) was found resistant against gentamicin and amikacin. Multiple drug resistance has been a consistence finding in the study of antibiogram of enterobacterial isolates. Out of 70 *Escherichia coli* isolates tested 11 (15.71 percent) isolates, 7 (10 percent) isolates and 47 (67.14 percent) isolates were found resistance to 2 antibiotics, 3 antibiotics and 4 or more antibiotics combinations respectively out of 12 antibiotics tested. The authors attributed the pattern of multiple drug resistant to large scale indiscriminate use of different antimicrobials as feed additives and for therapeutic purpose.

Introduction

In recent years *Escherichia coli* has emerged as a more problematic organism causing considerable losses worldwide due to increased susceptibility of birds. Many serotypes of *Escherichia coli* are normal inhabitant of large intestine, caecum and lower part of small intestine of healthy fowl and majority of them are nonpathogenic (Roy *et al.*, 2004). Resistance of *Escherichia coli* to antibiotics is well known, which is a major obstacle in the control of infection. The antimicrobial agents are of great value for devising curative measures against bacterial infections.

However, emerging trend of resistance in bacterial strains against antimicrobial agents has now become one of the major public health concerns in both developing and developed countries (Levy, 1982).

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(5): 1046-1048
Received: 10-07-2019
Accepted: 12-08-2019

Anil Kumar
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Bhanu Pratap
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Dharmendra Kumar Gautam
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Vikas Yadav
CHES (ICAR-CIAH), Panchmahal, Gujrat, India

Gangadhara K
CHES (ICAR-CIAH), Panchmahal, Gujrat, India

Karam Beer
ICAR-Indian Institute of Soil and Water Conservation, Koraput, Odisha, India

Ashutosh Kumar Singh
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Vivek Kumar Singh
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Correspondence
Anil Kumar
Department of Horticulture, NDUAT, Ayodhya, Uttar Pradesh, India

Variability, heritability and genetic advance studies in French marigold (*Tagetes patula* L.)

Anil Kumar, Bhanu Pratap, Dharmendra Kumar Gautam, Vikas Yadav, Gangadhara K, Karam Beer, Ashutosh Kumar Singh and Vivek Kumar Singh

Abstract
A field experiment was conducted at Main Experimental Station of Department of Horticulture, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya. The experiment was laid out in Randomized Block Design with 10 treatments and replicated thrice. The healthy seedlings were transplanted at a spacing of 30cm X 30cm. The observations were recorded from five plants selected randomly in each genotype per replication for 10 characters namely, plant height (cm), stem diameter (cm), plant spread (cm), number of primary branches, number of secondary branches, days taken to flower bud initiation, duration of flowering (days), number of flowers per plant, flower weight (g) and flower yield per plant (g). Analysis of variance showed highly significant differences for all the ten characters. In general, estimates of phenotypic coefficient of variation (PCV) were found to be higher than their corresponding genotypic coefficient of variation (GCV). High broad sense heritability coupled with high genetic advance was reported for number of flowers per plant (h^2 = 99.62%, GA = 59.78) and flower yield per plant (h^2 = 99.53%, GA = 133.82), showing additive gene effects and shows the effectiveness of selection of these characters.

Keywords: Variability, heritability, genetic advance, french marigold

Introduction
Marigold (*Tagetes spp.*), a member of Asteraceae family. It is one of the most important flower grown commercially in India. It is native of Central and South America especially Mexico. Genus Tagetes consists of 33 species, out of these species, *Tagetes erecta* L., commonly called African marigold, and *Tagetes patula* L. popular as French. Both the species of marigold are suitable for garden display and grown commercially for use as cut flowers and loose flowers. It is highly suitable as a bedding plant in an herbaceous border and is also ideal for newly planted shrubberies to provide colour and to fill the space. It has attracted the attention of flower growers due to its wide spectrum of attractive colours, shape, size and good keeping quality. Flowers of African marigold can be used for extraction of 1-lemoene, ecomene, 1-linylaetate, 1-linauol (Narsude *et al*., 2010) [9]. An extract obtained from the flowers is mixed with other ingredients in the preparation of an obtained which is used in curing ulcer. Orange colour marigold has emerged as rich source of carotenoid pigments namely xanthophyll, which is widely used as dietary supplement in poultry industry to enhance the chicken skin colour and egg yolk pigmentation (Naik *et al*., 2004) [8]. The demand for uniform, medium sized, compact bright colour flowers with more shelf life are very high in domestic flower market (Singh and Misra, 2012) [13]. Therefore, it is realized that under the changing scenario and advancement of floriculture sector, evaluation of marigold germplasm is essential to bring the suitable genotypes with desirable quality parameters and recommended to farmers for exploitation of their potential.

Genetic variation and genetic relationship among genotypes is an important consideration for classification, utilization of germplasm resources and breeding (Kumar *et al*., 2013) [7]. The presence and magnitude of genetic variability in a gene pool is the pre-requisite of a breeding programme (Bhujpal *et al*., 2013) [10]. Heritability provides us information about the additive genotypic variance and phenotypic variance. A knowledge of the estimates of genotypic coefficient of variation (GCV), phenotypic coefficient of variation (PCV), heritability (h2) and genetic advance as percentage of mean (GA) would help the breeder in selection of appropriate breeding methods. Keeping in view its wide importance, a study was conducted to assess the performance of ten marigold genotypes under Ayodhya conditions of Uttar Pradesh.

CSIRO PUBLISHING
Crop & Pasture Science, 2017, **68**, 1024–1030
https://doi.org/10.1071/CP17258

Biplot evaluation of test environments and identification of lentil genotypes with durable resistance to fusarium wilt in India

A. K. Parihar[A,K], *Ashwani K. Basandrai*[B], *D. R. Saxena*[C], *K. P. S. Kushwaha*[D], *S. Chandra*[E], *K. Sharma*[F], *K. D. Singha*[G], *Deepak Singh*[H], *H. C. Lal*[I], *and Sanjeev Gupta*[J,K]

[A]Crop Improvement Division, ICAR Indian Institute of Pulses Research, Kanpur 208 024, Uttar Pradesh, India.
[B]CSK HPKV Hill Agriculture and Extension Centre, Dhaulakuan, Sirmaur 176 047, Himachal Pradesh, India.
[C]RAK, College of Agriculture, Sehore 466 001, Madhya Pradesh, India.
[D]G.B. Pant University of Agriculture and Technology, Pantnagar 263 145, Uttarakhand, India.
[E]Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad 224 229, Uttar Pradesh, India.
[F]Rajasthan Agricultural Research Institute, Durgapura, Jaipur 302 018, Rajasthan, India.
[G]Regional Agricultural Research Station, Assam Agricultural University, Shillongani, Navgaon 782 002, Assam, India.
[H]Indian Agricultural Statistics Research Institute (IASRI), New Delhi 110 012, India.
[I]Birsa Agricultural University, Kanke, Ranchi 834 006, Jharkhand, India.
[J]All India Coordinated Research Project (AICRP) on MULLaRP, ICAR Indian Institute of Pulses Research, Kanpur 208 024, Uttar Pradesh, India.
[K]Corresponding authors. Email: ashoka.parihar@gmail.com; saniipr@rediffmail.com

Abstract. Fusarium wilt (caused by *Fusarium oxysporum* f. sp. *lentis*) is the most crucial limiting variable for decreasing yield levels of lentils (*Lens culinaris* Medik.) around the world. A set of 20 diverse lentil genotypes comprising breeding lines and released varieties was evaluated, along with susceptible controls, for resistance to fusarium wilt through natural incidence for two continuous years (2010–11 and 2011–12) in six diverse lentil-growing environments in India. Analysis of variance showed that the effect of genotype (G) and environment (E) for disease incidence was highly significant. Among the three sources of variation, the biggest contribution in disease occurrence was accounted for by environment (54.68%), followed by G × E interaction (17.32%). The high G × E variation necessitated assessment of the genotypes at different locations (environments). GGE biplot analysis of the studied genotypes revealed that genotype PL 101 and released cultivar L 4076 had low levels of disease incidence. The sources of resistance to fusarium wilt have great potential for use in lentil-breeding programs. Another biplot of relationships among environments demonstrated that, among the test locations, Sehore and Faizabad, were the most effective for differentiation of genotypes. On the basis of discriminating ability and representativeness, the Sehore location appeared an ideal testing site for natural incidence of *F. oxysporum* f. sp. *lentis*.

Additional keywords: disease resistance, genotype × environment interaction, GGE analysis, stability.

Received 2 February 2017, accepted 25 August 2017, published online 27 September 2017

Introduction

Lentil (*Lens culinaris* Medik.) is an important food legume and a reasonable source of protein (22–35%), minerals, fibre and starch for vegetarian people (Srivastava and Vasishtha 2012; Kumar *et al.* 2016). It is mainly grown in western Canada, central India, southern Turkey, West Asia, northern USA, Bangladesh, southern Europe and Australia (Harish 2012). Fungal diseases are serious constraints to lentil production in many parts of the world. Of them, wilt caused by the fungus *Fusarium oxysporum* f. sp. *lentis* is the most crucial limiting factor for reducing lentil yield globally (Taylor *et al.* 2007). The fungus is a warm-weather pathogen generally present in sandy, acidic soil and it can survive in the soil for a decade (Eagling 2009). Fusarium wilt is identified by abrupt drooping of the leaves, leading to drying of leaves and the ultimate death of the seedling. The root system appears sound, but it has decreased expansion and poor nodulation rate (Kraft *et al.* 1981). This fungus generally causes 5–10% yield reduction, but under favourable environmental conditions, the disease severity may cause complete crop devastation (Chaudhary and Kaur 2002). Management is difficult

Journal compilation © CSIRO 2017

Scanned with CamScanner

AJSS An Asian Journal of Soil Science
Volume 11 | Issue 1 | June, 2018 | 95-97 | e ISSN-0976-7231 ■ Visit us : www.researchjournal.co.in

Research Article

DOI: 10.15740/HAS/AJSS/11.1/95-97

Field evaluation of fungicides and botanicals against sheath blight, *Rhizoctonia solani* in rice (*Oryza sativa* L.)

■ SUBHASH CHANDRA, PANKAJ KUMAR AND SURESH KUMAR

Received : 22.01.2018, Revised : 29.03.2018, Accepted : 25.04.2018

MEMBERS OF RESEARCH FORUM:

Corresponding author :
SURESH KUMAR, Department of Soil Science and Agriculture Chemistry N.D. University of Agriculture and Technology, Kumarganj, FAIZABAD (U.P.) INDIA

Co-authors :
SUBHASH CHANDRA AND PANKAJ KUMAR, Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, FAIZABAD (U.P.) INDIA

Summary

Out of eight fungicides and six neem based products, evaluated in field conditions, propiconazole 25 EC @ 0.1 per cent appeared to be most effective which reduced the disease severity by 86.0 per cent and 86.11 per cent and increased yield by 136.06 per cent and 137.20 per cent in *Kharif* 2001 and 2002, respectively. Among the six botanicals evaluated as field spray, Neem azal @ 0.3 per cent was found to be most effective and it reduced 79.07 and 80.0 per cent severity of disease and increased 102.07 per cent and 100.94 per cent crop yield in *Kharif* 2001 and 2002, respectively.

Key words : *Rhizoctonia solani* Kuhn., Sheath blight, Fungicides, Botanicals

How to cite this article : Chandra, Subhash, Kumar, Pankaj and Kumar, Suresh (2018). Field evaluation of fungicides and botanicals against sheath blight, *Rhizoctonia solani* in rice (*Oryza sativa* L.). *Asian J. Soil Sci.*, 11 (1) : 95-97 : DOI : 10.15740/HAS/AJSS/11.1/95-97.

Introduction

Rice (*Oryza sativa* L.) is one of the most important cereal crop of the world. In India it occupies an area of 44.361 million hectares with production of 78.64 million tonnes, and productivity of 1.773 tonnes ha^{-1} (Mishra, 2004). It contributes 20.25 per cent of agricultural G.D.P.

This crop is subjected to attack by many diseases caused by fungi, bacteria, viruses, nematodes and several physiological disorders which caused annual loss to the tune of 12 to 25 per cent of the total production, while fungal diseases alone caused annual damage of 12 to 20 per cent of its production. Among these diseases, the sheath blight caused by *Rhizoctonia solani* Kuhn. earlier considered as minor disease is now regarded as an internationally important. In India, the disease was first reported by Paracer and Chahal in the year 1963 from Gurdaspur (Punjab). It is also designated as a banded blight disease of rice in North India. The pathogen mainly infect leaf sheath but symptoms may be produced on any aerial part of the rice plant.

Thus, sheath blight caused by *Rhizoctonia solani* Kuhn. is most economically important disease and have possessed challenge to the farmers for successful cultivation of rice and ultimately to the plant pathologists. Keeping this fact in view, evaluation of fungicides and botanicals against this pathogen were under taken in field conditions.

Resource and Research Methods

Eight fungicides and six neem based products were tested separately in two different sets of experiments against sheath blight to assess their efficacy. The field trials were conducted during *Kharif*, 2001 and 2002 crop

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2018; SP4: 197-198

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 197-198

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Ajay Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Efficacy of botanicals, bio-agents and fungicides against *Fusariumudum* causing wilt disease of pigeonpea *In Vitro*

Neeraj Kumar Rajvanshi, Subhash Chandra and Ajay Kumar

Abstract
Pigeon pea is an important pulse crop of India and its production is greatly affected by wilt disease. Pigeon pea wilt is a very destructive soil borne disease caused by *Fusariumudam*. In present research work plant extracts (Garlic, Neem, Tulsi), bio-agents (*Trichodrema viride* and *Pseudomonas fluorescens*) and fungicides (Vitavax, Bavistin and Thiram + Carbendazim) were tested against *Fusarium udum*. Fungicides namely Vitavax Power (0.2%), Bavistin 25SD (0.1%), Thiram + Carbendazim (0.3%) were tested by poisoned food technique *in vitro* and resulted cent per cent restriction of radial growth of *F. udum* up to 96 hrs. The results indicate that the antagonist effect on radial growth of *F. udum* was highest in *Pseudomonas fluorescens* (4.82 to 5.95mm) followed by *T. viride* (5.15 to 6.66mm) in comparison to check (81.00 to 90.00mm). The maximum inhibition was recorded at 10% concentration. The radial growth in plant extracts ranged from 2.32mm (Garlic bulb) to 6.15mm (Neem leaves) at 48 hrs of incubation period. The similar trends were also observed in 5% concentration of all incubation period.

Keywords: Pigeon pea, *Fusariumudum*, bio-agent, fungicide

Introduction
Pigeon pea (*Cajanus cajan* L. Millsp.) is one of the major pulse crops grown in the tropics and subtropics belonging to family Leguminaceae. It has wide adaptability and low input requirements mostly grown in *kharif* season. In India, the crop is mainly grown in Andhra Pradesh, Bihar, Uttar Pradesh, Karnataka, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. In Uttar Pradesh, it is grown 311.0 thousand ha area producing 325.0 thousand tons, with an average yield of 1040 kg/ha (Anonymous, 2014) [1]. The poor yield of pigeon pea is mainly due to biotic stress like diseases and insect pests but only few of them like wilt, sterility mosaic, *Phytophthora* blight and *Alternaria* blight are major and destructive ones. Among fungal pathogens, wilt disease caused by *Fusarium udum* Butler is an important disease in India, Kenya, Malawi, Nepal, Tanzania and Uganda (Reddy *et al.*, 1990) [7]. In India, it is the most serious problem all over the pigeon pea growing states especially in U.P, M.P, Bihar and Maharashtra. In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006) [9]. Management of pigeon pea wilt through fungicides applied as soil treatment such as Thiram, Ferbam, Carbendazim and Copper oxychloride have been reported by different workers. In discriminate use of these chemicals has led to development of fungicide resistance strain and more importantly, environmental pollution, posing a potential risk to animal and human health. Hence, for minimizing the losses caused by wilt need inexpensive and environmentally safe management practices. It was therefore considered desirable to evaluate botanicals, bio-agents and fungicides against wilt pathogen for effective management.

Material and Methods
Pigeonpea plants showing characteristic symptoms of *Fusarium* wilt were collected from pigeonpea experimental field, Department of Genetics and Plant Breeding, NDUA&T, Kumarganj, Faizabad for isolation and identification. The infected plant parts were cut in to small pieces and surface sterilized with 0.1 per cent mercuric chloride solution and washed

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2018; SP4: 195-196

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 195-196

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Ajay Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Evaluation of pigeonpea genotypes against *Fusarium udum* butler under artificial epiphytotic condition

Neeraj Kumar Rajvanshi, Subhash Chandra and Ajay Kumar

Abstract
Wilt of Pigeonpea is a very destructive disease caused by fungus *Fusarium udum* Butler. In India, Pigeonpea crop suffers a great loss due to this disease. The use of resistant variety is one of the best methods of disease management. Therefore, studies were planned to search out the genotypes against *Fusarium* wilt through sick plot technique. Out of 130 genotypes screened, ten genotypes (ICP-8859, ICP8860, ICP8862, ICP8863, ICP89049 ICP12731, BWR254, BWR370, AWR74/15 and Banda Palera were found resistant, 22 moderately resistant, 26 tolerant, 30 moderately susceptible and 42 were highly susceptible to *Fusarium* wilt.

Keywords: Epiphytotic, *Fusarium,* genotypes, resistant

Introduction
Pigeonpea is one of the major grain legume crops grown in the tropics and subtropics and commonly known as Arhar, Tur, Redgram, Cangopea and Gandul, holds an important position in Indian subcontinent. It is a *kharif* season crop that has wide adaptability and low input requirements. The heavy shedding of leaves adds considerable organic matter in to the soil. Pigeonpea is the 4th ranked pulse crop in the world. In India, Pigeonpea is the 2nd most important pulse crop after chickpea. Besides India, it is also grown in South East Asia, Africa, and America. In India, production of Pigeonpea was 3.17mt, on area of 3.88 m ha with yield of 817 kg/ha (Anonymous, 2014) [1]. In India, the crop is mainly grown in Andhra Pradesh, Bihar, Uttar Pradesh, Karnataka, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Tamilnadu. The poor yield of Pigeonpea is mainly due to biotic stress like diseases and insect pests. The maximum number of pathogen has been reported from India (Nene *et al.,* 1996) but only few of them like wilt is the most important, major and destructive ones.

The crop suffers heavily due to *Fusarium* wilt in the major growing areas resulting into huge production losses (Vishwa Dhar *et al.*, 2005). In India, it is the most serious problem all over the Pigeonpea growing states especially in U.P., M.P., Bihar and Maharashtra. In the epiphytotic conditions, disease incidence was recorded 15-25 per cent in general and up to 50 per cent (Butler, 1910). In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006). In discriminate use of chemicals for controlling the disease has led to development of fungicide resistance strain and more importantly, environmental pollution, posing a potential risk to animal and human health. Due to high cost and hazardous effect of used chemical pesticides from last thirty years are not valid today. Hence, for minimizing the losses caused by wilt need inexpensive and environmentally safe management practices.

Materials and Methods
Seeds of one hundred thirty genotypes of Pigeonpea were obtained from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) and IIPR, Kanpur. The genotypes were screened under artificial epiphytotic conditions (Sick plot technique) using the methods described by Nene *et al*., (1982) [5]. The plots (sick soil) showed over 90 per cent wilt incidence in susceptible cultivars (Bahar) of Pigeonpea were used for screening the test varieties. After germination, observations were

Scanned with CamScanner

CSIRO PUBLISHING
Crop & Pasture Science, 2018, 69, 1113–1125
https://doi.org/10.1071/CP18259

Targeting test environments and rust-resistant genotypes in lentils (*Lens culinaris*) by using heritability-adjusted biplot analysis

A. K. Parihar[A,J], *Ashwani K. Basandrai*[B], *K. P. S. Kushwaha*[C], *S. Chandra*[D], *K. D. Singha*[E], *R. S. Bal*[F], *D. Saxena*[G], *Deepak Singh*[H], *and Sanjeev Gupta*[I,J]

[A]Crop Improvement Division, ICAR–Indian Institute of Pulses Research, Kanpur 208 024, Uttar Pradesh, India.
[B]CSK HPKV Hill Agriculture and Extension Centre, Dhaulakuan, Sirmaur 176 047, Himachal Pradesh, India.
[C]G. B. Pant University of Agriculture and Technology, Pantnagar 263 145, Uttarakhand, India.
[D]Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad 224 229, Uttar Pradesh, India.
[E]Regional Agricultural Research Station, Assam Agricultural University, Shillongani 782 002, Navgaon, Assam, India.
[F]Regional Research Centre, Punjab Agriculture University, Gurdaspur 143 521, Ludhiana, Punjab, India.
[G]Chandrashekhar Azad University of Agriculture and Technology, Kanpur 208 002, Uttar Pradesh, India.
[H]Indian Agricultural Statistics Research Institute (IASRI), New Delhi 110 012, India.
[I]All India Coordinated Research Project (AICRP) on MuLLaRP, ICAR–Indian Institute of Pulses Research, Kanpur 208 024, Uttar Pradesh, India.
[J]Corresponding authors. Email: ashoka.parihar@gmail.com; saniipr@rediffmail.com

Abstract. Lentil rust incited by the fungus *Uromyces viciae-fabae* is a major impedance to lentil (*Lens culinaris* Medik.) production globally. Host-plant resistance is the most reliable, efficient and viable strategy among the various approaches to control this disease. In this study, 26 lentil genotypes comprising advanced breeding lines and released varieties along with a susceptible check were evaluated consecutively for rust resistance under natural incidence for two years and at five test locations in India. A heritability-adjusted genotype main effect plus genotype × environment interaction (HA-GGE) biplot program was used to analyse disease-severity data. The results revealed that, among the interactive factors, the GE interaction had the greatest impact (27.81%), whereas environment and genotype showed lower effects of 17.2% and 20.98%, respectively. The high GE variation made possible the evaluation of the genotypes at different test locations. The HA-GGE biplot method identified two sites (Gurdaspur and Pantnagar) as the ideal test environments in this study, with high efficiency for selection of durable and rust-resistant genotypes, whereas two other sites (Kanpur and Faizabad) were the least desirable test environments. In addition, the HA-GGE biplot analysis identified three distinct mega-environments for rust severity in India. Furthermore, the analysis identified three genotypes, DPL 62, PL 165 and PL 157, as best performing and durable for rust resistance in this study. The HA-GGE biplot analysis recognised the best test environments, restructured the ecological zones for lentil-rust testing, and identified stable sources of resistance for lentil rust disease, under multi-location and multi-year trials.

Additional keywords: disease resistance, ideal environments.

Received 5 June 2018, accepted 10 September 2018, published online 30 October 2018

Introduction

Lentil (*Lens culinaris* Medik.) is a nutritionally rich, winter food legume crop that is grown in many countries (Negussie and Pretorius 2012; Kumar *et al.* 2016; Parihar *et al.* 2017*a*). The major geographical regions contributing to lentil production are the Americas (55.4%), Asia (36.8%), Africa (2.9%), Oceania (2.9%) and Europe (1.9%). Among countries, Canada, India, Turkey, USA, Nepal, Australia, Ethiopia and China have maximum share (FAOSTAT 2016). Significant improvement has been made in lentil cultivation in the recent past through use of conventional breeding. However, several biotic stresses such as Fusarium wilt, rust, Ascochyta blight, anthracnose and Stemphylium blight are serious constraints to lentil production in many parts of the world (Muehlbauer *et al.* 2006). Therefore, diseases have become major factors limiting yield and quality of lentil seeds. Of them, rust, a foliar disease incited by the fungus *Uromyces viciae-fabae* (Pers.) J.Schröt., is a widely distributed and economically important disease present in major lentil-growing regions such as South America, and countries such as India, Bangladesh, Ethiopia, Nepal, Morocco and Pakistan, and causing 25–100% yield loss under congenial conditions

Journal compilation © CSIRO 2018

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2018; SP4: 241-244

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 241-244

Subhash Chandra
Department of Genetics & Plant Breeding, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

NK Rajvanshi
Department of Genetics & Plant Breeding, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ajay Kumar
Department of Genetics & Plant Breeding, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pankaj Kumar
Department of Entomology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Pankaj Kumar
Department of Entomology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Management of vascular wilt (*Fusarium Oxysporum* F.SP. *lentis*) of Lentil (*Lens Culinaria* Medic.) through botanicals and bioagents

Subhash Chandra, NK Rajvanshi, Ajay Kumar and Pankaj Kumar

Abstract
Lentil is an important pulse crop and plays very important role in the supply of the protein to under nourished vegetarian population of the country. *Fusarium* wilt of lentil caused by *Fusarium oxysporum* f. sp. *lentis* is one of the wide spread and destructive diseases in India under rice-based cropping system. Use of synthetic fungicides has led to the emergence of several problems like environment pollution, residual effect in grains and killing of non-target organism(s). Hence, for minimizing the losses caused by *Fusarium* wilt, four plant extracts such as Garlic, Neem, Eucalyptus, Tulsi and three antagonistic bio-agents *viz. Trichoderma viride, Trichoderma harzianum* and *Pseudomonas fluorescence* were evaluated. The disease incidence was not much reducing by Neem (40.50 %) and Tulsi (34.45 %) at 10 per cent concentration of 60 days after sowing. The same trends were also found in per cent disease reduction. However, per cent disease reduction in between Eucalyptus (25.50 %) and Garlic (28.00 %), Tulsi (34.45 %) was at par to each other. The Maximum per cent disease reduction was found in Eucalyptus (25.50 %) and Garlic (28.00 %), Lowering the disease incidence and higher per cent disease reduction was also found in *Trichoderma viride* (19.64 %) as compared to *Trichoderma harzianum* (35.50 %) and *Pseudomonas fluorescence* (28.43 %) at 10 per cent concentration of 60 days after sowing.

Keywords: fenugreek, hematological, *O. niloticus*, serum

Introduction
Lentil (*Lens culinaris* Medik.) is an important pulse crop and the second major source of dietary proteins (25%) after soybeans in human and animal diet (Rahman *et al*., 2010) [10]. In India, it is the extensively grown cool season legume crop next to chickpea in terms of quality and quantity (Khan *et al*., 2001) [6]. The crop is infected by a number of fungal plant diseases and out of which vascular wilt is the most devastating caused by several Fusarium species. It is recognized the most important factor in reducing lentil production (Saxena, 1993; Erskine *et al*., 2009) [1]. The wilt disease occurs either at early (seedling) crop stage or at reproductive (adult plant) stage (Stoilova & Chavdarov, 2006) [13]. Presently, lentil production in India is facing continuous decrease as a result of several biotic stresses including wilt (Subhani *et al*., 2007) [14]. A number of management strategies aiming at controlling wilt disease are in practice. The cultural practices like crop rotation is common, however, it is not much effective because the pathogen is of seed or soil-borne nature and can survive in soil for extended period of time. Botanicals and biological management are considered to be the effective in reducing the inoculum present in soil. Among biological control agents, *Trichoderma* species are considered the most effective against several fungal pathogens including *F. oxysporum* (Sarhan *et al*., 1999) [11]. These antagonists are saprophytic filamentous fungi, easily growing and produce conidia having long survival period in large quantities (Mohamed & Haggag, 2006) [8]. Therefore, it is essential to determine the variability in the pathogen regarding its host plant resistance for a successful lentil breeding plan and replacing the low yielding and disease susceptible lentil varieties with those of high yielding and disease resistance ones. Considering these facts, this study was carried out to evaluate the available lentil germplasm, botanicals and bio-control agents against the disease in order to identify sources of resistance, effective botanicals and bio-control agents soil application for the management of lentil wilt

Scanned with CamScanner

frontiers in Plant Science

ORIGINAL RESEARCH
published: 10 July 2019
doi: 10.3389/fpls.2019.00825

Deciphering Genotype-by-Environment Interaction for Targeting Test Environments and Rust Resistant Genotypes in Field Pea (*Pisum sativum* L.)

Arpita Das[1], Ashok K. Parihar[2], Deepa Saxena[3], Deepak Singh[4], K. D. Singha[5], K. P. S. Kushwaha[6], Ramesh Chand[7], R. S. Bal[8], Subhash Chandra[9] and Sanjeev Gupta[10]**

[1] Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, India, [2] ICAR – Indian Institute of Pulses Research, Kanpur, India, [3] Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, India, [4] ICAR – Indian Agricultural Statistics Research Institute, New Delhi, India, [5] Regional Agricultural Research Station, Assam Agricultural University, Jorhat, India, [6] G. B. Pant University of Agriculture and Technology, Pantnagar, India, [7] Banaras Hindu University, Varanasi, India, [8] Regional Research Centre, Punjab Agricultural University, Ludhiana, India, [9] Narendra Deva University of Agriculture and Technology, Faizabad, India, [10] All India Coordinated Research Project on MULLaRP, ICAR – Indian Institute of Pulses Research, Kanpur, India

Rust caused by *Uromyces viciae-fabae* is a major biotic constraint to field pea (*Pisum sativum* L.) cultivation worldwide. Deployment of host-pathogen interaction and resistant phenotype is a modest strategy for controlling this intricate disease. However, resistance against this pathogen is partial and influenced by environmental factors. Therefore, the magnitude of environmental and genotype-by-environment interaction was assessed to understand the dynamism of resistance and identification of durable resistant genotypes, as well as ideal testing locations for rust screening through multi-location and multi-year evaluation. Initial screening was conducted with 250 diverse genotypes at rust hot spots. A panel of 23 promising field pea genotypes extracted from initial evaluation was further assessed under inoculated conditions for rust disease for two consecutive years at six locations in India. Integration of GGE biplot analysis and multiple comparisons tests detected a higher proportion of variation in rust reaction due to environment (56.94%) as an interactive factor followed by genotype × environment interaction (35.02%), which justified the requisite of multi-year, and multi-location testing. Environmental component for disease reaction and dominance of cross over interaction (COI) were asserted by the inconsistent and non-repeatable genotypic response. The present study effectively allocated the testing locations into various categories considering their "repeatability" and "desirability index" over the years along with "discrimination power" and "representativeness." "Mega environment" identification helped in restructuring the ecological zonation and location of specific breeding. Detection of non-redundant testing locations would expedite optimal resource utilization in future. The computation of the confidence limit (CL) at 95% level

OPEN ACCESS

Edited by:
Jose C. Jimenez-Lopez, Consejo Superior de Investigaciones Cientificas (CSIC) Granada, Spain

Reviewed by:
Diego Rubiales, Instituto de Agricultura Sostenible (IAS), Spain
Xueyan Wang, Noble Research Institute, LLC, United States

***Correspondence:**
Ashok K. Parihar
ashoka.parihar@gmail.com
Sanjeev Gupta
sanijpr@rediffmail.com

Specialty section:
This article was submitted to Plant Breeding, a section of the journal Frontiers in Plant Science

Received: *23 January 2019*
Accepted: *07 June 2019*
Published: *10 July 2019*

Citation:
Das A, Parihar AK, Saxena D, Singh D, Singha KD, Kushwaha KPS, Chand R, Bal RS, Chandra S and Gupta S (2019) Deciphering Genotype-by- Environment Interaction for Targeting Test Environments and Rust Resistant Genotypes in Field Pea (Pisum sativum L.). Front. Plant Sci. 10:825. doi: 10.3389/fpls.2019.00825

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2019; SP2: 955-956

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; SP2: 955-956

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Ajay Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Evaluation of lentil genotypes against *Fusarium oxysporum* f. sp. *Lentis* under artificial epiphytotic condition

Subhash Chandra, Neeraj Kumar Rajvanshi and Ajay Kumar

Abstract
Wilt of lentil is a very destructive disease caused by fungus *Fusarium oxysporum* f. sp. *Lentis*. In India, lentil crop suffers a great loss due to this disease. The use of resistant variety is one of the best methods of disease management. Therefore, studies were planned to search out the genotypes against *Fusarium* wilt through sick plot technique. Keeping this point in view, one hundred fifty genotypes of lentil were tested for the resistance against *Fusarium oxysporum* f. sp. *lentis* in field condition. It is evident from the result presented in table 2 that out of 150 genotypes, 66 genotypes *viz.*; RLG-109, VL-138, IPL-316, LL-1136, K-75, RLG(105), PL-101, LL-1187, IPL-532, KLB-104, L-4704, IPL-529, LL-1135, KLS-107, IPL-531, DPL-62, IPL-318, SL-28, PLO-98, L-4702, IPL-219, RLG-112, L-4076, LH84-8, HPLC-649, L-1114, L1161, IPL-215, PLO-097, IPL-319, L-4076, DPL-15, IPL-526, IPL-220, VL-142, DL-11-5, IPL-531, KLS-113, VL-143, IPL-325, L-4588, LL-1231, L-4707, PL-129, IPL-325, IPL-324, PL-117, IPL-529, IPL-319, IPL-513, IPL-521, RLG-147, HUL-57, L-4688, L-4147, IPL-315, VL-134, NDL7-402, L-4076, VL-516, RLG-73, IPL-314, VL-133, VL-515, IPL-526, L-4589 and LH07-27 were found resistant, 37 genotypes were found moderately resistant, 34 genotypes were found moderately susceptible, 9 genotypes were found susceptible and 4 genotypes *viz.*; RVL-48, L-4590, HUL-57 and RLGF-109 were found highly susceptible. None of the genotypes was found immune against the disease.

Keywords: Epiphytotic, *Fusarium*, genotypes, resistant.

Introduction
Legumes occupy unique crops in the world by virtue of their high protein content (15-35), carbohydrates, fiber, minerals and nutrients in seeds and it have capability to fix atmospheric nitrogen in symbiotic association with root nodule bacterium (Rhizobium). According to the Indian Council of Medical Research optimum requirement of the pulses for person to maintain his health is 10 µg/days. However not even half of this quantity is available to the people. In India most of the population is primarily vegetarian pulses has a special place in the daily diet about (7-15%) of food grain, of people due to its high protein contents and several uses. India is a major pulse growing country of the world. During 1996-97 pulses occupied 71.4 million hectares of the world with a total production of 57 million tones and average yield of 806 kg /ha. (FAO, 1997), while in India pulses were grown on 1.60 million hectare with the production of 0.94 million tones and average yield 591 kg/ha (Anonymous, 2012) [1, 2]. Lentil (*Lens culinaris*) also known as masoor, is one of the important pulse crop after chickpea and pea among Rabi pulses. In India, it is grown 15 lakh /hectare. With production 9.5 tones' and productivity 633.33 kg/ha and mainly grown in U.P., Bihar, M.P. and West Bengal.
In Utter Pradesh it grown about 0.59 million/hectare with 0.41 million/tones production and productivity 695 kg/hectare (Source Department of Economics 2011-12). Lentil belongs to the order-Rosoles, sub orders- Rosneae, family-Leguminaceae and sub family-papilionaceae. In India, it is grown in winter season. Mostly lentil is grown in India as a rain fed crop by marginal formers in their marginal lands using their local seeds without any input like improved seeds, fertilizers, irrigation and pesticides and consequently economic return is poor. A number of factors are responsible for this low yield. Depredations by diseases are one of them.
The lentil crop is infected by a large number of pathogens such as fungi, bacteria, Virus & nematodes which significantly contribute to poor yields. Among the disease wilt, Anthracnose, Alternaria blight, Ascochyta blight, black root rot, gray mold, rust, powdery mildew and collar rot are important in different part of the country. In this region *Fusarium* wilt caused by *Fusarium oxysporum* f. sp. *lentis*, Rust caused by *Uromyces fabae*, Alternaria blight caused by *Alternaria alternate*, collar rot is caused by *Corticium rofsii* and powdery mildew is caused by *Erysiphe pisi* are widely distributed in Rabi season, The crop suffers heavily due to *Fusarium*

Scanned with CamScanner

Progressive Research – An International Journal
Volume 14 (1) : 30-32, (2019)
Print ISSN : 0973-6417, Online ISSN : 2454-6003

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

SCREENING OF CHICKPEA (*Cicer arietinum* L.) GENOTYPES AGAINST FUSARIUM WILT (*Fusarium oxysporum* F. SP. CICERIS)

Subhash Chandra, Neeraj Kumar Rajvanshi and Pankaj Kumar
**N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P.*
E-mail : *chandrasubhash75@yahoo.in*

ABSTRACT

Fusarium wilt is major disease in Central India, the major chickpea growing state of country, Madhya Pradesh, Rajsthan, Uttar Pradesh, Jharkhand, Maharashtra, Bihar, Punjab, Haryana, Andhra Pradesh and Chhattisgarh. The disease is soil borne causing heavy loss, development of wilt resistant varieties is most effective means of controlling this disease. Highly resistant sources of wilt in lentil have not been reported from the Indian chickpea breeding programme. Fifty chickpea genotypes including one susceptible check were evaluated in green house against wilt, based on controlled condition - GL 0006, GL 10023, GJG 1208, Avrodhi, NDG 15-2, Udai, NDGK-99-9, NDG-13-14, NDG-13-21, NDG-54, Vijay, Vishal, JG-1 and PG-186 have been identified as highly resistant genotypes. These can be used in hybridization programme for wilt resistance breeding and studying the inheritance of wilt resistance in lentil.

Key words : *Fusarium oxysporum f.sp. ciceris, screening, resistant, susceptible*

Chickpea (*Cicer arietinum* L.) an important pulse crop, which belong to Fabaceae family, ranking third after dry beans (*Phaseolus vulgaris* L.) and dry pea (*Pisum sativum* L.) (1). India the large producer and consumer of pulse accounting for 35 per cent of world area and 25 per cent of the output in India (2). In India, total pulse had the area of 252.43 lakh ha. with production of 187.00 lakh tonnes. and productivity 741 Kg/ha. In India total chickpea had the area of 99.27 lakh ha. with production of 98.80 lakh tonnes and productivity 995 Kg/ha (3). It is grown in Madhya Pradesh, Rajsthan, Uttar Pradesh, Jharkhand, Maharashtra, Bihar, Punjab, Haryana, Andhra Pradesh and Chhattisgarh. However, six major states viz., Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka and Andhra Pradesh altogether contribute 91 per cent of the production and 90 per cent of the area. In U. P. chickpea is grown an area of 5.14 lakh ha. with production of 4.63 lakh ha. and productivity 901 kg /ha. (3). In inspite the barring efforts made by different agencies to boost up it is production. The total production and productivity per unit area is very low among the various factors responsible for yield one of the major factors is the chickpea caused by different pathogens. The pathogen of the disease is soil borne can survive in soil, even in the absence of its host, for six years. It is one of the major diseases of chickpea and at national level, the yield losses encountered was reported about 60 per cent (4). The pathogen of chickpea wilt disease is seed borne (5) as well as soil borne. In India, the incidence of this disease has been reported at seedling, flowering and podding stage at temperature 25°C ± 2°C. Disease management is required to ensure the stable chickpea production. The most sustainable and effective resolution to this problem is the development of resistant cultivars (6). Chickpea germplasm can be screened in field but field screening has limitations such as, confounding effect of drought and other root rot pathogens. While screening under controlled conditions in glasshouse is required. Stable resources are required for breeding wilt resistant varieties. Hence this study was carried out with specific objective of identifying lentil genotypes resistant to *Fusarium oxysporum* f.sp. *ciceris* through pot screening.

MATERIAL AND METHOD

Out of fifty genotypes of chickpea including one susceptible check (K-850) were obtained from the department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.). The genotypes were screened through sick pot techniques in glass house during 2016-17 crop season using the method which described by (7). The seeds were superficially sterilized in 3% sodium hypochlorite for 3 min, then washed in sterile water and then germinated in towel paper for 10 days. Inoculum of pure culture of *Fusarium oxysporum* f.sp. *ciceris*, isolated from naturally wilt infected lentil plants was used for multiplication. Single spore culture of *F. oxysporum* f.sp. *ciceris* was multiplied on 100 gm of 9:1 sand lentil meal medium for 15 days at 28±2°C. Two hundred gram of these inoculums was mixed well with 2.5 kg autoclaved soil and placed in one 25 cm plastic pots. The 10-day-old uprooted seedlings were washed under tap water to remove soil particles. Root tips approximately 1.0 cm long were cut to facilitate the entry of pathogen in to roots. The roots of the seedlings were then immersed in the spore suspension (5×10^6 conidia/ml) for 5 min to enable conidia to stick to the roots. Inoculated seedlings were transplanted into a mixture of equal parts of sterile soil, sand, peat and per liter which had been potted and pre-irrigated 2 days previously. Seedlings were irrigated after their planting in pots, and incubated at 25±2°C. The

Scanned with CamScanner

International Journal of Chemical Studies 2019; 7(3): 439-440

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 439-440
© 2019 IJCS
Received: 24-03-2019
Accepted: 28-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

RM Tripathi
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Reaction of urdbean (*Vigna mungo*) genotypes against *Cercospora* leaf spot (CLS)

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, RM Tripathi and MP Chauhan

Abstract
The present investigation aimed to identify resistance in urdbean (Vigna mungo) against *Cercospora* leaf spot (CLS) in a field condition. The trial was conducted at Genetics and Plant Breeding Farm of Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya. Forty six urdbean genotypes were screened in the summer season of the year of 2015- 2016. The severity of was recorded following 0-9 scale. The urdbean genotypes evaluated were grouped into different categories based on disease reaction. The present results indicated that genotype IPU 11-2, PU 10-23, KU 96-7, Pant U 19, TU 94-2, VBG 09-005, KPU 524-65, NIRB-004, DKU 11, Vamban 7, NDUK 13-6, CO 5, KUG 725, PU 10-16, NUL 7, Pant U 30, WBU 108, NIRB-003, Shekhar 3, NDUK 15-9, TU 67, VBG 12-062, RMG 353, IU 05-1, VBG 11-053, IPM 94-1, RUG 55 and TU 22 were resistant to CLS, 6 genotypes *viz*.; AKU 11-15, K 851, KU 96-3, LBG 645, NIRB-002, COBG 11-03 were exhibited moderately resistant, 05 genotypes *viz*.; LBG 623, MU 46, MU 44, KU 14-1, DBG 11 were showed moderately susceptible, 06 genotypes *viz*.; RUG 59, IPU 2-43, Pant U 31, KUG 479, IPU 13-1, KPU 129-104 were susceptible and only one genotype was highly susceptible. None of these genotypes was found free from infection. The urdbean genotypes which were found resistant the could be the choice for resistance against CLS.

Keywords: urdbean, *Cercospora*, *Vigna mungo*, CLS

Introduction
Pulses represent one of the most important foods that have been extensively used to cover basic protein and energy needs in day today life. Pulses have unique property of maintaining and restoring soil fertility through biological nitrogen fixation as well as covering and improving physical properties of soil by virtue of their deep root system. Urdbean or Blackgram (*Vigna mungo* L.) Hepper is the most important pulse crop of the *'vigna'* group. It is considered to have been domesticated in India from its wild ancestral form (*V. mungo* var. *Silvestris* Lukoki, Marechal & Otoul). Center of genetic diversity is found in India (Zeven and de Wet. 1982) [7]. It is an important crop of India and extensively grown over a wide range of agroclimatic zones of the country.

In India, urdbean occupies 4.50 m ha area, production 2.83 mt and productivity 628 kg/ha (Anonymous, 2018) [1]. Highest productivity of urdbean is reported from West Bengal followed by Andhra Pradesh and Uttar Pradesh. Urdbean is prone to several fungal diseases, among which *Cercospora* leaf spot (CLS) caused by *Cercospora* canescens. Eills and Mortin is one of the most important fungal disease of urdbean causing heavy yield losses particularly in Uttar Pradesh and Uttarakhand states. Disease is also reported from other states *viz*., Punjab, Haryana, Bihar, Rajasthan, West Bengal, Himachal Pradesh and Jammu & Kashmir (Saksena and Dwivedi, 1973) [6]. Previously *Cercospora* leaf spot was considered as minor disease. Due to change in cropping system and introduction of yellow mosaic resistant varieties it is becoming an important fungal disease and constraint in production of this crop. Resistance is fundamental attributes of all living systems. Host plant resistance (HPR) is the most efficient and ecofriendly means of management. For exploitation of HPR, reliable field and controlled environment screening techniques are essential. Therefore, the present investigation was undertaken with an objective to identify the sources of resistance in different genotypes of urdbean against *Cercospora* leaf spot.

Scanned with CamScanner

International Journal of Chemical Studies 2019; 7(3): 466-468

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 466-468
© 2019 IJCS
Received: 01-03-2019
Accepted: 05-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Evaluation of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against web blight

Subhash Chandra, Neeraj Kumar Rajvanshi, MP Chauhan and Mukesh Kumar

Abstract
Web blight (*Rhizoctonia solani*) of mungbean is a very destructive disease caused by fungus *Rhizoctonia solani*. In India, mungbean crop suffers a great loss due to this disease.Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, fifty two genotypes of mungbean were tested for the resistance against web blight in field condition. Out of fifty two genotypes of mungbean were carried out under field condition of natural infection, where twenty nine genotypes *viz.*; BM 2012-09, Palampur 93/kulu-4, LGC 574, NUL 516, T-44, SGC 20, SML 1082 (SC), IPM 312-19, IGKM 06-42, VG 10-008, MH 921, ML 2412, PUSA 571, RMG 1082, PUSA 1472, ML 2410, ML 2333, COGG-912, KM 2348, AKM 12-17, IPM 312-20, GM 11-02, KM 2241, ML 818, HUM-1, CO6, LGG 460, IPM 02-3 and GM 04-02 were found resistant, five genotypes were recorded moderately resistant, thirteen genotypes were noticed moderately susceptible, four genotypes *viz.*; NVL 825, DUG 5, VBN 4, RMG 1028 were recorded susceptible. Only one genotype K-851was found highly susceptible.

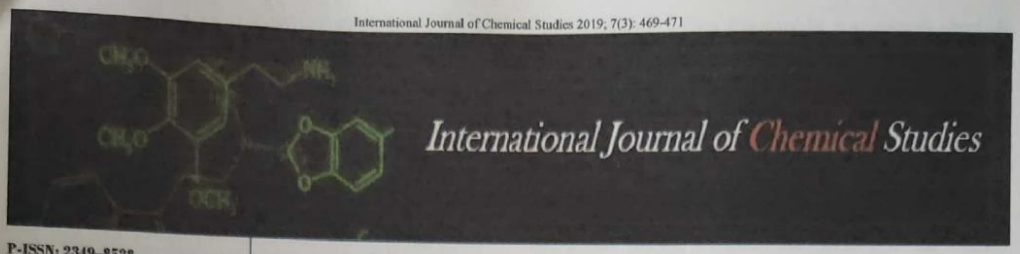
Keywords: Evaluation, mungbean, web blight, *Vigna radiate*

Introduction
Mungbean (*Vigna radiata*) belongs to fabaceae family along with good sources of protein, carbohydrates and vitamins for mankind all over the world. Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India, the name greengram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [3]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz.*, *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [10]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1].

Mungbean has been considered as "poor men's protein". It contains 26% protein, 51% carbohydrate, 4% minerals, 3% vitamins and 10% moisture (Khan, 1981) [7]. The standard worldwide yield of mungbean is very low (389kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al.*, 2005) [6]. The crop is infected by a large number of pathogens consisting of (virus, bacteria, fungi and nematodes) which significantly contribute to poor yields. Among the diseases, Yellow mosaic, Web blight, Bacterial blight, Leaf crinkle, Powdery mildew, Cercospora leaf spot, Anthracnose and Macrophomina bight are important in different parts of the country which reducing the yield of mungbean heavily. Previously web blight was considered as minor disease.

Scanned with CamScanner

International Journal of Chemical Studies 2019; 7(3): 469-471



P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 469-471
© 2019 IJCS
Received: 04-03-2019
Accepted: 08-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against mungbean yellow mosaic virus (MYMV) under field condition

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, Mukesh Kumar and MP Chauhan

Abstract
Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India it is third most important pulse crop after chickpea and pigeonpea. Mungbean is an important short duration grain legume which is grown in different parts of the country, for grain and green manuring. It is an outstanding source of easily digestible proteins with low flatulence, which balances the staple rice diet in Asia. Mungbean yellow mosaic disease (MYMD) caused by whitefly (*Bemisia tabaci*) transmitted mungbean yellow mosaic virus (MYMV) is an important constraint of mungbean in India. Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, out of fifty two genotypes of mungbean were tested for the resistance against MYMV during *Kharif* 2015 in field condition. The per cent disease incidence (PDI) of MYMV among 52 mungbean genotypes was worked out up to ninth week after sowing and it varied from 0 to 79.68 %. Out of fifty two mungbean genotypes, five were found resistance, eight were moderately resistant, seventeen genotypes were recorded moderately susceptible and twenty two genotypes were noticed susceptible. Five genotypes namely, PM 10-18, PUSA 1371, BM 2012-09, DGGV-2 and MH 810 found resistant during present investigation which can be used for the development of mapping population for the development of MYMV resistant varieties.

Keywords: mungbean, genotypes, resistance and yellow mosaic virus

Introduction
Mungbean (*Vigna radiata* L.) is also known as green gram, green bean, moong, mash bean, golden gram and green soy (Saminathan 2013) [10]. In India, the name green gram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [2]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz*., *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [11]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1]. The standard worldwide yield of mungbean is very low (389 kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus, nematodes and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al*., 2005) [3]. Twelve viral diseases are reported on mungbean crop *viz*., Mungbean yellow mosaic virus (MYMV) disease, Bean yellow mosaic virus (BYMV) disease, Southern bean mosaic virus (SBMV) disease, Leaf crinkle virus (LCV) disease, Mungbean mosaic virus (MMV) disease, Cowpea aphid-borne virus (CABV) disease, Cucumber yellow mosaic virus (CMV) disease, Alfalfa

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2019; 8(4): 938-939

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 938-939
Received: 20-05-2019
Accepted: 24-06-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ajay Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Kumari Punam
Department of Botany, JP. University Chhapra, Bihar, India

Correspondence
Kumari Punam
Department of Botany, JP. University Chhapra, Bihar, India

New sources of resistance against *fusarium oxysporum* f.sp. *Udum* causing wilt of pigeonpea

Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar, Popin Kumar and Kumari Punam

Abstract
Fusarium wilt is a serious disease in pigeonpea, which causes severe yield losses. The *F. udum* is host specific to pigeonpea and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. Out of 51 germplasm, screened twelve germplasm *viz.*; AL 1932, BRG 5, CRG 2013-10, GRG 82, GRGK 1, ICP 8863, ICPHL 4989-7, KA 12-3, PT 257, PT 307-1, WRG 293 and ICP 8863 were found resistant, 21 moderately resistant, 2 tolerant, 11 moderately susceptible and 5 germplasm *viz.*; AKT 12-1, AL 1933, ICP 2376, KA 12-2, BAHAR 6424 were highly susceptible to *Fusarium* wilt.

Keywords: Pigeonpea, *Fusarium,* germplasm, resistant

Introduction
Pigeonpea [*Cajanus cajan* (L) Mills.] is major pulse crop grown component of pulses grown in the tropics and subtropics and belongs to family leguminosae. It commonly known as Arhar, Tur, Redgram, Cangopea and Gandul, holds an important position in Indian subcontinent. It possesses high protein content and is consumed in the form of split pulse as dal. It is a *kharif* season crop that has wide adaptability and low input requirements. The heavy shedding of leaves adds considerable organic matter into the soil. Pigeonpea is the 4th ranked pulse crop in the world. In India, Pigeonpea is the 2nd most important pulse crop after chickpea. Besides India, it is also grown in South East Asia, Africa and America. In India, production of Pigeonpea was 42.54 Lac tones on area of 44.31 Lac ha with yield of 960 kg/ha (Anonymous, 2018) [1]. In India, the crop is mainly grown in Andhra Pradesh, Bihar, Uttar Pradesh, Karnataka, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Tamilnadu. The poor yield of pigeonpea is mainly due to biotic stress like diseases and insect pests. The crop is infected by 210 pathogens (83 fungi, 4 bacteria, 19 viruses and mycoplasma and 104 nematodes) reported from 58 countries. The maximum number has been reported from India with 98 pathogens (Nene *et al.,* 1996) [7], but only few of them like wilt, sterility mosaic, phytophthora blight and Alternaria blight are major and destructive diseases. Among these, wilt disease caused by *Fusarium udum* is the most serious problem all over the Pigeonpea growing states especially in U.P., M.P., Bihar and Maharashtra. The *F. udum* is host specific to pigeonpea (Patel *et al.*, 2011) [8] and can survive in soil under wilted plant stubble for a long period. In the epiphytotic conditions, disease incidence was recorded 15-25 per cent in general and up to 50 per cent (Butler, 1910) [3]. In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006) [11]. The best way of wilt management is by growing resistant varieties. For developing resistant varieties, resistant source are the basic requirements. Identification of resistant sources involves testing germplasm under heavy inoculum potential and under conditions conducive for maximum disease development. Sick plot technique has been reported for large scale screenings under field conditions and a sick soil technique (pot screening) for confirming resistance.

Materials and Methods
Seeds of fifty one germplasm of Pigeonpea were obtained from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) and IIPR, Kanpur. Entries were sown on the month of late june or early july in the uniform wilt plots with the onset of the man soon (rainy) season. The germplasm were screened under field condition (Sick plot technique) in RBD design with two replications using the methods described by Nene *et al.*, (1982) [6]. After germination observations were recorded regularly up to 60 days for the appearance of wilt symptoms and severity. The number of

Scanned with CamScanner

International Journal of Chemical Studies 2019; 7(4): 361-362

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 361-362
© 2019 IJCS
Received: 16-05-2019
Accepted: 20-06-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Field evaluation of pigeonpea (*Cajanus cajan*) genotypes against fusarium wilt to disease resistance

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar and Mukesh Kumar

Abstract
The pigeonpea germplasms/genotypes were evaluated to identify the sources of resistance to Fusarium wilt disease. The *F. udum* is host specific to pigeonpea and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. Out of 54 screened genotypes, twenty one genotypes *viz.* BDN2001-6, BRG2-7, CORG2004-01, CORG990013, H2000-37, H2000-47, IPC7119, IPC8863, IPA14F, JKM186, JKM197, JKM204, JKM205, JKM209, KAWR11, KAWR91, NTL30, PT02-25, PT02-5, PT11-39, and PUSA2005-1 were found resistant, 15 moderately resistant, 13 tolerant, 4 moderately susceptible and 1 genotype were highly susceptible against fusarium wilt. The most susceptible variety Bahar showed 80 per cent wilting.

Keywords: Pigeonpea, *Fusarium,* germplasm, resistant

Introduction
Pigeonpea [*Cajanus cajan* (L.) Millsp.], also referred to as red gram or *arhar,* is a perennial shrub, with its centre of origin located in India. It is an important grain legume crop predominantly grown in the Indian subcontinent as an important source of dietary protein. In India, production of Pigeonpea was 42.54 Lac tones on area of 44.31 Lac ha with yield of 960 kg/ha (Anonymous, 2018) [1]. It is also cultivated in other parts of the world, including sub-Saharan Africa, Latin America, the Caribbean and South-East Asia. Its cultivation is increasing in semi-arid areas because of the crop's ability to thrive under prolonged drought and in degraded lands (Upadhyaya *et al*., 2012) [11]. The crop is mainly grown as annual using cultivars with different durations to maturity: 90 days (Short), 120 days (Medium) and 180 days (Long). It is cultivated as a perennial crop in several regions of India. The shift of pigeonpea cultivation from the traditional *kharif* season to pre *rabi* September sowing in north Bihar has not only shown an increased production potential of this important pulse crop but have also opened altogether a new possibilities in land use pattern of the rain fed areas of Bihar and adjoining states. Fresh pods are consumed as a vegetable; dried mature grains are used for cooking or in processing. Among the several factors responsible for reduction yield and quality deterioration of pigeonpea in India, diseases occupy a vital place. Among the diseases, wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeonpea in India leading to heavy production losses. The disease since been reported from Bangladesh, Ghana, Grenanda, Indonesia, Kenya, Malawi, Mauritius, Tanzania, Thialand, Trinida, Uganda and Zambia. In India it is the most serious problem all over the Pigeonpea growing states especially in U.P., M.P., Bihar and Maharashtra. In the epiphytotic conditions, disease incidence was recorded 15-25 per cent in general and up to 50 per cent (Butler, 1910) [2]. In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006) [10].

Materials and Methods
Seeds of fifty four genotypes of Pigeonpea were obtained from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) and IIPR, Kanpur. The genotypes were screened under artificial conditions (Sick plot technique) using the methods described by Nene *et al*., (1982) [5].

Scanned with CamScanner

International Journal of Chemical Studies 2019; SP6: 688-690

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 688-690

Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pandey
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Divya Singh
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vivo evaluation of bio agents, botanical and fungicides against *Fusarium oxysporum* f. sp. *basilica*

Rajendra Prasad, S.K. Pandey, Subhash Chandra, Neeraj Kumar Rajvanshi and Divya Singh

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. For the management of wilt disease of Holy Basil (*Ocimum sanctum*) the experimental finding depicted in Table no.3 reveal that among 6 treatment which include three bio-agent T_1 *Trichoderma viride*, T_2 *Trichoderma harzianum* and T_3 *Pseudomonas fluorescence* and one botanicals T_4 Neem leaves and two chemicals T_5 Tebuconazole and T_6 Mancozeb. The most effective was Tebuconazole 250 EC @ 0.1% with percent disease control and percent disease intensité, (68.20) and (19.67) respectively. And Mancozeb 75WP @ 0.1%. With PDC and PDI (62.54) and (23.17), respectively where as the bio-agent *Trichoderma viride* Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. Distilled water) with PDC and PDI (45.41) and (33.75), respectively. *Trichoderma harzianum* (Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. distilled water) with PDC and PDI (37.02) and (38.94) respectively and *Pseudomonas fluorescence* @ 4 gm/kg seed with PDC and PDI (27.76) and (44.62) respectively. and Neem leaves @ 5% with PDC and PDI (16.98) and (51.53).The used fongicide and bio pesticide significantly reduce the wilt of *Ocimum sanctus*.

Keywords: Tulsi, *Pseudomonas fluorescence*, Tebuconazole

Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L.(Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum Sims* (Dulal Tulsi), *Ocimum basilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke* (Camphor Basil) *and Ocimum americanum* Linn (Hoary Basil) among them holy Basil *(Ocimum sanctum)* has been well known for its therapeutic potential (Prakash and Gupta, 2005) [2].The chemical constituents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*.2004) [1] In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy,

Scanned with CamScanner

International Journal of Chemical Studies 2019; SP6: 746-748

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 746-748

Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pande
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshiand
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar Maurya
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vitro evaluation of bioagents, botanical and fungicides against *Fusarium oxysporum* f.sp. *baisilici*

Rajendra Prasad, SK Pande, Subhash Chandra, Neeraj Kumar Rajvanshiand and Manish Kumar Maurya

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. *In vitro* studies reveal that highest inhibition was observed in chemical fungicide Tebuconazole (91.81) followed by other fungicide Mancozeb (78.33) followed by bio-agents *Trichoderma viride* (74.82), *Trichoderma harzianum* (71.77) *and Pseudomonas fluorescence* (69.55) *and* one botanical Neem leaves (65.55) in respect to control. All the bio-agents produce toxic volatile metavolatile, which reduced the radial growth of the test fungus. That is *Fusarium oxysporum* f.sp.*baisilici* (7.50) Tebuconazole, Mancozeb (19.57) followed by bio-agents *Trichoderma viride* (22.62) *Trichoderma harzianum* (25.40) *and Pseudomonas fluorescence* (27.40) *and* one botanical Neem leaves (31.00).

Keywords: Tulsi, *Pseudomonas fluorescence,* Tebuconazole.

1. Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L. (Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum sims* (Dulal Tulsi), *Ocimum baisilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke* (Camphor Basil) *and Ocimum americanum* Linn (Hoary Basil) among them holy Basil (*Ocimum sanctum*) has been well known for its therapeutic potential (Prakash and Gupta, 2005) [4]. The chemical constiuents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*. 2004) [2]
In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy, haemeopathy, leucoderma, asthma, bronchitis, catarrhal fever, otalgeia, hepatopathy, vomiting, lumbago, hiccups, ophthalmia, gastropathy, genitourinary disorders, ringworm, verminosis and skin diseases etc. It is commonly used in cough, cold and mild indigestion. Despite its therapeutic potential, holy Basil is susceptible to various disease including *Fusarium* wilt, Bacterial leaf spot, Dampping off, and Downy mildew, among them wilt caused by *Fusarium oxysporum* f. sp. *baisilici,* is most common and destructive disease of holy Basil. It becomes a

Scanned with CamScanner

International Journal of Chemical Studies 2019; SP6: 809-811

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 809-811

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of lentil genotypes against *Fusarium oxysporum* f. sp. *lentis* in field condition

Subhash Chandra, Mukesh Kumar, Neeraj Kumar Rajvanshi and Virendra Prasad Chaudhary

Abstract
Lentil (*Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. Lentil wilt is a very destructive disease caused by fungus *Fusariumoxysporum* f. sp. *Lentis*. In India, lentil crop suffers a great loss due to this disease. The use of resistant variety is one of the best methods of disease management. Therefore, studies were planned to search out the genotypes against *Fusarium* wilt through sick plot technique. Keeping this point in view, one hundred forty three genotypes of lentil were tested for the resistance against *Fusariumoxysporum* f. sp. *lentis* in field condition, out of which 53 genotypes were found highly resistant, 35 genotypes were found resistant, 16 genotypes were found moderately resistant, 18 genotypes were found susceptible and 21 genotypes highly susceptible. None of these genotypes was found free from infection.

Keywords: Lentil, *Fusarium*, genotypes, resistant

Introduction

Lentil *(Lens culinaris* Medik) is a member of Leguminosae family and it is commonly known as poor man's meat. It has a high nutritional value and major source of dietary proteins (25%) after soybeans (Zia *et al.*, 2011) [8]. Lentil (*Lens culinaris* Medik L.) is the most important pulse crop in India and mostly grown in north east plain zone & central part of India. It is a diploid and self-pollinated crop which is grown in winter season and belonging to Order-Rosales, suborder- Rosneae, Family- Leguminaceae (fabaceae), subfamily- papilionaceae, genus- *Lens* and species- *culinaris* with chromosome number 2n=14. Among *rabi* pulses, lentil is next to chickpea. The total area under lentil in India was 1.49 m ha with a total production of 1.61 MT and 1006 Kg/ha productivity (Anonymous, 2018) [1]. In Uttar Pradesh, it is grown on 4.78 lakh hac. area with 4.47 lakh tones production and productivity 936 kg/ha (Anonymous, 2018) [1].

Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by *Fusarium oxysporum* f. sp. *lentis*. Average yield of lentil is low due to various diseases. Among the disease, foot and root rot of lentil caused by *Fusarium oxysporum* and *Sclerotium rolfisii* are common and the most serious disease in India. The fusarium wilt of lentil caused by *Fusarium oxysporum* f. sp. *lentis* is one of the most important and destructive disease in India wilt pathogen minimize crop yield and deteriorate the seed quality (Khare, 1991) [5]. The disease was first reported from Hungary but in India it was first observed in 1941 from Delhi and Karnal. If infection takes place in early stage the plant do not produced seeds, formed few in number when infection occurred in later stage. Wilt causes more damage at flowering and

Scanned with CamScanner

Int.J.Curr.Microbiol.App.Sci (2019) *8*(8): 2733-2743

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 08 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.808.315

Management of White Mold Fungus *Sclerotinia sclerotiorum* (Lib) De Bary Causes Disease in Tomato under *In vitro* Conditions

N. K. Upadhyay[1*], Ved Ratan[1], Subhash Chandra[2], V. K. Yadav[2], Ajay Kumar[2], Deepak Awasthi[1], and Jai P. Rai[3]

[1]*Department of Plant Pathology, C.S. Azad University of Agriculture and Technology, Kanpur-222131(UP), India*
[2]*Department of Plant Pathology, N.D.U.A. & T., Kumarganj, Ayodhya-224229 (UP), India*
[3]*Krishi Vigyan Kendra, Inst. of Ag. Sci., RGSC, BHU, Barkachha, Mirzapur 231001, UP, India*

**Corresponding author*

Keywords

Sclerotinia, management, white mould, *in vitro*, tomato

Article Info

Accepted:
22 July 2019
Available Online:
10 August 2019

ABSTRACT

Tomato crop affected by different fungal diseases in which Fruit rot known as target spot disease incited by *Sclerotinia sclerotiorum* is one of the most destructive disease. Disease severity varied (30.50 to 18.60%) in different locations of Kanpur. Highest disease severity was (30.50%) and the lowest disease severity (18.60%) was noticed at the farmer's field of Billhore, Kanpur. *Sclerotinia sclerotiorum* is a soil borne pathogen which causes symptoms on ripe fruits. Pathogen isolated from infected fruits. Copper oxychloride, Kavach, Tebucanazol, Andrachite, Dithane M-45, Metalaxyl, Roko and Bavistin completely suspected the growth of pathogen*in vitro*. Among eight fungicides, Tebuconazol, Andrachite, Metalaxyl, Roko, and Bavistin were found effective against pathogen under *in vitro* and *in vivo* conditions. However, seven bio-agents (*Trichoderma* spp.), *T. koningii*, *T. virens*are found effective in bothconditions. *In vitro* eight fungicides were tested against pathogen in which Metalaxyl, Roko, Tebucanazol, Andrachite and Bavistin showed 100% growth inhibition. Seven bio-agents (*Trichoderma*spp.) were tested *in vitro* while, among them *T. koningii* showed maximum inhibition followed by *T. virens*, *T. longibrachiatum*, *T. atroviridae*, *T. asperallum*, *T. viridae* and *T. reesei*, respectively. Eight treatments were applied *in vivo* for disease management however, among them T_6 (*Bacillus subtilis* + bavistin) recorded the minimum disease incidence and maximum fruit yield.

Introduction

Sclerotinia sclerotiorum (Lib.) is a serious fungus affecting yield and product quality of many susceptible hosts. It is a widespread soil borne plant pathogen with an extremely wide host range of more than 400 plant species including many of economic importance (Gao *et al.*, 2014). *S. sclerotiorum* is responsible for more than 60 plant diseases (Purdy, 1979). The pathogen produces sclerotia, which survive for long periods and attackroots of growing and mature plants, resulting in root rot, basal stemcanker, and wilt (Duncan *et al.*,

Scanned with CamScanner

The Pharma Innovation Journal 2020; 9(3): 293-296

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(3): 293-296
© 2020 TPI
www.thepharmajournal.com
Received: 23-01-2020
Accepted: 28-02-2020

Subhash Chandra
Department of Plant Pathology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar
Department of Plant Pathology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Rajvanshi
Department of Plant Pathology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SKS Rajpoot
Department of Entomology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
SKS Rajpoot
Department of Entomology
Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Efficacy of seed dresser fungicides, botanicals and bioagents against *fusarium oxysporum* f. sp. *Lentis in vivo.*

Subhash Chandra, Mukesh Kumar, Neeraj Kumar, Rajvanshi, Virendra Prasad Chaudhary and SKS Rajpoot

Abstract
Lentil (*Lens culinaris* Medik) is a member of Leguminaceae family and it is commonly known as poor man's meat. Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by *Fusarium oxysporum* f. sp. *lentis*. The highest per cent disease control was found in T_8 Metalaxyl 8% + Mancozeb 64% + Neem leaf extract + *P. fluorescens* (87.75%) followed by T_6 Metalaxyl 8% + Mancozeb 64% + *P. fluorescens* (81.54%), T_7 Metalaxyl 8% + Mancozeb 64% *T. harzianum* (79.62%) T_5 Metalaxyl 8% + Mancozeb 64% Neem leaf extract 10% (73.88%), T_1 Metalaxyl 8% + Mancozeb 64% (71.50%), T_3 *P. fluorescens* (68.83%), T_4 *T. harzianum* (66.88%) and T_2 Neem leaf extract 10% (64.68%). as compared to T_9 control (0.0).

Keywords: Lentil, fusarium, fungicides, evaluation, neem

Introduction
Lentil (*Lens culinaris* Medik) is a member of Leguminaceae family and it is commonly known as poor man's meat. It has a high nutritional value and major source of dietary proteins (25%) after soybeans (Zia *et al.,* 2011) [10]. Lentil (*Lens culinaris* Medik L.) is the most important pulse crop in India and mostly grown in north east plain zone & central part of India. It is a diploid and self-pollinated crop which is grown in winter season and belonging to Order-Rosales, suborder-Rosnee, Family-Leguminaceae (fabaceae), subfamily- papilionaceae, genus-*Lens* and species- *culinaris* with chromosome number 2n=14. Among *rabi* pulses, lentil is next to chickpea. The total area under lentil in India was 1.49 m ha with a total production of 1.61 MT and 1006 Kg/ha productivity (Anonymous, 2018) [1]. In Uttar Pradesh, it is grown on 4.78 lakh hac. Area with 4.47 lakh tones production and productivity 936 kg/ha (Anonymous, 2018) [1].

Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by *Fusarium oxysporum* f. sp. *lentis*. Average yield of lentil is low due to various diseases. Among the disease, foot and root rot of lentil caused by *Fusarium oxysporum* and *Sclerotium rolfisii* are common and the most serious disease in India. The fusarium wilt of lentil caused by *Fusarium oxysporum* f. sp. *lentis* is one of the most important and destructive disease in India wilt pathogen minimize crop yield and deteriorate the seed quality (Khare, 1991) [6]. The disease was first reported from Hungary but in India it was first observed in 1941 from Delhi and Karnal. If infection takes place in early stage the plant do not produced seeds, formed few in number when infection occurred in later stage. Wilt causes more damage at flowering and pod formation stage of the crop. *Fusarium oxysporum* f. sp. *lentis*. Infection range from 25-95 % depending on the cultivars tested. Lentil wilt caused by *Fusarium oxysporum* f. sp. *lentis* is a major disease in lentil growing areas in the country reported that the annual yield losses 10-15 % due to this disease alone which valued approximately Rs. 2000-2500 crores by (Chaudhary and Amarjit, 2002) [2].

Resistant sources are available against wilt disease of lentil but they are unstable. At present wilt is being managed by using fungicide through seed and soil treatment. However, fungicides are more costly and pollutant to environment. Many plant extract are known to have antifungal activity. Therefore, keeping in view the importance of the crop, seriousness of the disease, non-availability of suitable management practices and gaps in our knowledge

Scanned with CamScanner

The Pharma Innovation Journal 2020; 9(3): 321-324

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(3): 321-324
© 2020 TPI
www.thepharmajournal.com
Received: 03-01-2020
Accepted: 06-02-2020

Subhash Chandra
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Neeraj Kumar
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Rajvanshi
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology
Acharya Narendra Deva
University of Agriculture and
Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Comparison among botanicals, bio-agents and chemical control against *fusarium oxysporum* f. sp. *ciceris in vitro*

Subhash Chandra, Mukesh Kumar, Neeraj Kumar Rajvanshi and Virendra Prasad Chaudhary

Abstract
Chickpea (*Cicer arietinum* L.) is one of the most important pulse crops, so far its acreage and production is concern. Chickpea has been well recognized for source of protein, nutritive value where majority of the population of India depend on the low priced food for meeting its dietary requirements. The disease is caused by *Fusarium oxysporum* f. sp *ciceris*. Fungicides used for disease management caused by pathogens are known to pollute the environment, soil and water resulting deleterious effects on human health and biosphere. In present investigation, extracts of five plant species namely, Neem (*Azadirachta indica*), Garlic (*Allium sativum*), Onion (*Allium cepa*), Zinger (*Zingiber officinale*), two bioagents *Trichoderma viride*, *T. harzianum* along with two fungicides Carbendazim and Thiram were evaluated for fungi toxicity against *Fusarium oxysporum* f. sp. *ciceris*. The results clearly showed that all fungicides were effective against pathogen to inhibit mycelial growth *in vitro* conditions. Plant extracts and bioagents also more or less inhibited mycelial growth of *Fusarium oxysporum* f. sp. *ciceris in vitro* conditions.

Keywords: Botanicals, bioagents, fungicides, *fusarium oxysporum* f. sp. *ciceris*

Introduction
Chickpea (*Cicer arietinum* L.) commonly known as Gram or Bengal gram belong to the family Fabaceae is an important *Rabi* season pulse crop in India. It is the world's third most important pulse crop, after dry beans (*Phaseolus vulgaris* L.) and dry peas i.e. *Pisum sativum* L. (Vishwadhar and Gurha, 1998) [10]. In India, total pulse had the area of 31.11 mha with production of 24.51 mt. and productivity 788 Kg /ha. In India total chickpea had the area of 10.76 mha with production of 11.16 mt. and productivity 1037 Kg /ha (Anonymous, 2018) [1, 2] However, six major states *viz*., Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka and Andhra Pradesh altogether contribute 91 per cent of the production and 90 per cent of the area. In Uttar Pradesh, chickpea is grown an area of 562 thousand ha with production of 626.00 thousand ton and productivity 1114 kg /ha. (Anonymous, 2018) [1, 2].
The total production and productivity per unit area of chickpea is very low. Among the various factors, different pathogens responsible for yield losses of chickpea. Wilt is one of the major diseases of chickpea at national level; the yield losses encountered was reported about 60 per cent (Singh *et al*., 2007) [9]. Wilt disease of chickpea caused by *Fusarium oxysporum* f. sp. *ciceris* is a complex and destructive in nature. The genus *Fusarium* had many soil borne species which were distributed worldwide and known as plant pathogens since a long time ago. In order to overcome to this disease, a laboratory experiment was conducted to know the efficacy of botanicals and bio-agents against *Fusarium oxysporum* f. sp. *ciceris*.

Materials and Methods
The efficacy of various plant extracts against *Fusarium* wilt of chickpea *viz*., Neem leaves extract (*Azadirachta indica)*, Garlic bulb extract (*Allium sativum)*, Tulsi leaves extract (*Ocimum sanctum*), Onion bulb extract (*Allium cepa*), Zinger rhizome extract (*Zingiber officinale*), two botanicals *Trichoderma viride, Trichoderma harzianum* and two fungicides Carbendazim and Thiram were used. Fresh leaves, rhizomes and bulb were collected and washed thoroughly in clean water. 100 gram of each washed plant material was grinded in pestle and mortar by adding equal amount (100 ml) of sterilized water (1 : 1 v/v) and heated at 80°C for 10 minutes in hot water bath. The materials was filtered through double layered muslin cloth followed by filtering through sterilized Whatman No.1 filter paper and treated as standard plant extract (100%). To study the inhibitory effect of botanicals on mycelial growth

Scanned with CamScanner

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; SP-9(1): 180-184
© 2021 IJCS
Received: 18-11-2020
Accepted: 22-12-2020

Kumari Punam
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Virendra Prasad Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ujjal Kumar Ghosh
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Corresponding Author:
Kumari Punam
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Effect of post-harvest treatments on physiological loss in weight and fungal spoilage of Langra mangoes (*Mangifera Indica* L.) during storage

Kumari Punam, Subhash Chandra, Virendra Prasad Chaudhary, Neeraj Kumar Rajvanshi and Ujjal Kumar Ghosh

DOI: https://doi.org/10.22271/chemi.2021.v9.i1d.11562

Abstract
The effect of calcium salts (calcium nitrate and calcium chloride) and Gibberellic acid on physiological loss in weight (PLW %), spoilage loss (%), economic life (days) and intensity of rotting of fruits during storage of Langra mangoes was studied. The fruits were treated with $Ca(NO_3)_2$ at the concentration of 1,2 and 3 per cent, $CaCl_2$ at the concentration of 1,2 and 3 per cent and GA_3 at the concentration of 50, 100 and 150 ppm. Untreated fruits served as the control. All treatments exhibited significant reduction in PLW and spoilage loss, increased economic life and delay in the onset of pathogenic invasion. At end of experiment, GA_3 100 ppm and $Ca(NO_3)_2$ at 2 per cent proved most promising treatment in these regards and were able to restrict the PLW at 17.86and18.33, Spoilage at 12.00 and 12.65 per cent respectively which was recorded 49.87 and 38.76 per cent respectively in case of control. The economic life under these treatments was 15 and 12 days in comparison to 6 days under control. These treatments were also proved excellent in restricting the invasion of pathogen up to 12th day of storage whereas fruits under control were found heavily infected on this day. The microorganism associated with the decay was identified as *Aspergillus niger*.

Keywords: Mango, Langra, Calcium nitrate, Calcium chloride, GA_3, PLW, Spoilage, Economic life, *Aspergillus niger*

Introduction
Mango (*Mangifera indica* L.), the king of fruits belongs to the family Anacardiaceae. Among the fruits of universal importance, mango is placed on top and is the most popular fruit among millions of people. Mango is fifth widely produced fruit crop of the world after bananas, apples, grapes and oranges. Mango is grown throughout the length and breadth of the country except the temperate and arid regions. The number one mango producing country in the world is India. It contributes approximately 50% of the global mango supply. In India, during 2015-16, it was grown in an area of 2.209 million hectares with a production of 18.643 million tonnes and productivity of 8.4 tonnes/hectare (Anonymous, 2017) [1].

Mango fruit has been found rich source of carbohydrate, minerals and vitamins having moisture 73.0 to 86.7 per cent, carbohydrate 11.6 to 24.3 per cent, protein 0.3 to 1.0 per cent (Kumar, 1999) [3, 10-13]. Among the cultivated varieties of Bihar, the variety Langra is most famous and is one of the most popular cultivars of India (Khara *et al*, 2016) [9]. In domestic market this variety has good demand and is able to fetch highest price in the market of Bihar. However, owing to its highly perishable nature and below average keeping quality, export potential of this variety is yet to be capitalised.

Mango showed highly prominent post-harvest loss because of its high perish ability and climacteric pattern of respiration. This massive reduction in weight of fruits during storage is also very common in mango. The possible cause of weight loss is assigned to moisture loss by process of evapo-transpiration and respiration. As estimated by Lashley (1984) [14], approximately 30 to 50% fruits go waste during post-harvest handling, storage and ripening. Singh *et al.* (1998) [19, 22-24] reported that in India, post-harvest loss of fresh mango fruits due to microbial decay varies from 20-33%.Therefore, a critical examination becomes imperative to prolong the shelf life of the fruits and to know the causes and remedies of post-harvest losses in fresh fruits in order to save the interest of farmer's community and consumers as well.

Scanned with CamScanner

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; SP-9(1): 204-207
© 2021 IJCS
Received: 19-11-2020
Accepted: 24-12-2020

Kumari Punam
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SKS Rajpoot
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manish Maurya
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Kumar
Food Corporation of India, Regional office, Vijaywada, Andhra Pradesh, India

Ujjal Kumar Ghosh
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of post-harvest treatments on quality attributes like total soluble solids, total sugar and reducing sugar of langra mangoes (*Mangifera indica* L.) during storage

Kumari Punam, Subhash Chandra, SKS Rajpoot, Manish Maurya, Rajan Kumar and Ujjal Kumar Ghosh

DOI: https://doi.org/10.22271/chemi.2021.v9.i1d.11581

Abstract
The effect of calcium salts (calcium nitrate and calcium chloride) and Gibberellic acid on quality attributes and consumer's acceptability of Langra mangoes during storage was examined. The fruits were treated with $Ca(NO_3)_2$ at the concentration of 1, 2 and 3 per cent, $CaCl_2$ at the concentration of 1, 2 and 3 per cent and GA_3 at the concentration of 50, 100 and 150 ppm. Water treated fruits were taken as control. Data were recorded in respect of TSS, reducing sugars and total sugars under influence of these treatments. All treatments were found effective in maintaining the higher level of these quality attributes of fruits during entire course of the experiment. At end of trial, $Ca(NO_3)_2$ at 2% was proved as the best treatment in respect of TSS, reducing sugars and total sugars and was able to maintain the level of these up to 24.32%, 9.00% and 20.05% respectively.

Keywords: Mango, langra, calcium nitrate, calcium chloride, Ga_3, TSS, reducing sugar, total sugar

Introduction
Mango (*Mangifera indica* L.) is a tropical, climacteric fruit that is very popular among million of peoples world-wide. Mango, the king of fruits belongs to family Anacardiaceae. Mango is fifth widely produced fruit crop in the world after banana, apple, grape and orange. India ranks first in term of production in the world. It contributes approximately 50% of the global mango supply. In India, during 2015-16, it was grown in an area of 2.209 million hectares with a production of 18.643 million tonnes and productivity of 8.4 tonnes/ hectare (Anonymous, 2017) [2].

Nutritionally, it contains β carotene, β cryptoxanthin, vitamin C, and dietary fibre (Pal, 1998) [12] as well as soluble sugars and various minerals used as good sources of nutrition, and are readily available and easily assumable in human body (Singh *et al.*, 2000) [1, 18, 19]. Approximately 30-50% fruits wasted during postharvest handling, storage, and ripening. Among the fruits mango manifested high postharvest losses because of its high perishability and climacteric pattern of respiration. Mango always decays after harvest, and postharvest losses can be minimized by applying improved storage technology and prolonging the shelf life of fruits. Among the cultivated varieties of Bihar, the variety Langra is most famous and is one of the most popular cultivars of India (Khara *et al*, 2016) [4]. In domestic market this variety has good demand and is able to fetch highest price in the market of Bihar. However, owing to its highly perishable nature and below average keeping quality, export potential of this variety is yet to be capitalised.

Earlier efficacy of pre and post-harvest applications of certain chemicals and growth hormones in maintaining the quality of fruits during storage has been established. Gibberellins as a pre-harvest spray was reported as an efficient growth regulator in enhancing fruit storability and marketability through its action on cell juvenility and retardation of senescence, fruit coloration and softness (Macleod and Millar, 1962) [9]. Post-harvest spray of calcium increases the productivity of mango due to reduction of abscission and it enhances the fruit quality by increasing the fruit firmness and by maintaining the turgidity of middle lamella cells (Ranjan *et al.*, 2005) [17]. Fruits storability was also improved by $CaCl_2$ under cold storage (Ahmed *et al.*, 2000) [1]. Low fruit calcium levels have been associated with reduced post-harvest life and physiological disorders. Pre-harvest sprays of calcium compounds and GA_3 significantly

Scanned with CamScanner

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3818-3824

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3818-3824
Journal homepage: http://www.ijcmas.com

Original Research Article

Antagonistic Effect of Fungicide, Botanicals and Bio-agents against *Fusarium* wilt of Lentil caused by *Fusarium oxysporum* f. sp. *lentis*

Subhash Chandra[1]*, Rajeev Kumar[1], Manish Kumar Maurya[1], S. K. S. Rajpoot[2], Abhimanyu[3], Vikash Kumar Yadav[1] and Rajendra Prasad[1]

[1]Department of Plant Pathology,
[2]Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India
[3]Department of Plant Protection, Krishi Vigyan Kendra, Farrukhabad, Chandra Sekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India
**Corresponding author*

A B S T R A C T

Lentil wilt caused by *Fusarium oxysporum* f. sp. *lentis* is an important disease and it is a limiting factor to production of lentil. The present study to evaluate the antifungal activity of fungicide, botanicals through food poison technique and bio-agents through dual culture. Results revealed that minimum radial growth was obtained at 500ppm and 1000ppm in metalaxyl 8% + mancozeb 64% (00.00) followed by Neem leaf extract @ 10% (10.90 mm) having per cent inhibition (75.78%), Garlic @ 10% (11.00mm, 75.56%), Onion @ 10% (11.60mm; 74.22%), Neem leaf extract @ 5% (12.4mm; 72.45%). Among bio-agents, *P. fluorescence* showed maximum per cent inhibition (78.92%) followed by *T. viride* (66.82%), *T. harzianum* (60.76%), *B. subtilis* (58.94%), *T. virens* (55.62%).

Keywords

Antagonist, bio-agents, botanicals, in vitro, lentil

Introduction

Lentil *(Lens culinaris* Medik) is a member of Leguminaceae family. It has a high nutritional value and major source of dietary proteins (25%) after soybeans (Zia *et al.*, 2011). In India, most of the population is primarily vegetarian. Pulses have a special place in the daily diet of people due to its high protein contents and several uses (Ali and Mishra, 2000). Major lentil growing states in India are Madhya Pradesh (42.50%), Uttar Pradesh (31.25%), West Bengal (9.38%) and Bihar (8.75%). In India, lentil was grown in 1.49 mha with production of 1.61 mt with an average production of 1006 kg/ha (Anonymous, 2018).

Lentil crop is affected by many fungal diseases. Among them *Fusarium* wilt caused by *Fusarium oxysporum* f. sp. *lentis* is one of the major soil borne disease causes an economic loss all over the world (Bayaa *et al.*, 1998 and Taylor, 2007). *Fusarium oxysporum* f. sp. *lentis* infection range from 25-95 per cent depending on the cultivars

Scanned with CamScanner

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3813-3817

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3813-3817
Journal homepage: http://www.ijcmas.com

Original Research Article

Identification of Resistance Sources of Lentil against Wilt Disease Caused by *Fusarium oxysporum* f. sp. *lentis*

Subhash Chandra[1]*, Rajeev Kumar[1], Manish Kumar Maurya[1], Vikash Kumar Yadav[2], S. K. S. Rajpoot[2], Ajay Kumar[3] and Kumari Punam[4]

[1]Department of Plant Pathology, [2]Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India
[3]Department of Plant Pathology, Amar Singh P.G. College, Lakhavaoti, Bulandshahar, Uttar Pradesh, India
[4]Department of Botany, Jai Prakash University, Chapra, Bihar, India

**Corresponding author*

ABSTRACT

Lentil is affected by the wilt disease caused by fungus *Fusarium oxysporum* f. sp. *lentil* which causes an economic yield loss. The fungus seed and soil borne in nature and reported from almost all lentil growing areas where this crop is grown. The present study is carried out to find the resistant sources against Fusarium wilt of lentil. 100 genotypes were screened under glass house condition. The genotypes were categorized into Highly resistant (25 genotypes) resistant (11 genotypes), moderately resistant (19 genotypes), susceptible (23 genotypes) highly susceptible (22 genotypes) reaction against the pathogen. Twenty five genotypes were found highly resistant namely, PL 269, PL 4, Pant L – 8(PL 063), PL 252, PL 276, L 4717, LH 84-8, LL 1525, IPL 220, IPL 238, IPL 540, IPL 342, IPL 344, IPL 233, IPL 81, IPL 234, DPL 15, VL 152, VL 156, VL 531, VL 532, VL 157, KLB-1442, KLS 1451, RKL 14-112.

Keywords

Fusarium, genotypes, lentil, resistance, wilt

Introduction

Lentil (*Lens culinaris* Medik) ranks third in the world after chickpea and pea (FAO 2015). It is an annual, autogamous, diploid crop (2n=14) and self pollinated crops. Lentil also known as 'Poor man's meat' as it is rich in nutrients, include 60-67% carbohydrates, 20-36% protein, <4% lipid, and 2-3% ash on dry weight basis (Bhatty, 1988). It is widely used in a range of dishes and reputed to have many uses in traditional medicine (Yadav *et al.*, 2007). Major lentil growing states in India are Madhya Pradesh (42.50%), Uttar Pradesh (31.25%), West Bengal (9.38%) and Bihar (8.75%). In India, lentil was grown in 1.49 mha with production of 1.61 mt with an average production of 1006 kg/ha (Anonymous, 2018).

Lentil crop is affected by many fungal diseases. Among them Fusarium wilt caused by *Fusarium oxysporum* f. sp. *lentis* is one of the major soil borne disease causes an economic loss all over the world (Bayaa *et al.*, 1998 and Taylor, 2007). *Fusarium*

Scanned with CamScanner

Journal of Horticulture and Pest Science, 1(1): 63-66 (June: 2021) DOI: 10.46492/JHPS/2021.1.1.8

ISSN: xxxx - xxxx

Journal of Horticulture and Pest Science

(An International Peer Reviewed Open Access Journal)

Online available at www.agriinventionjournal.com

ISSN: xxxx - xxxx

In vitro evaluation of bioagents, botanical and fungicides against *Fusarium oxysporum* f. sp. *baisilici*

***Subhash Chandra[1], Neeraj Kumar Rajvanshi[1], Ajay Kumar[2]**

[1]Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India
[2]Department of Plant Pathology, Amar Singh (P.G.) College, Lakhaoti, Bulandshahr, Uttar Pradesh, India
***Corresponding Email:** *chandrasubhash75@yahoo.in*

Article Information
Original Research Article
Received on March 15, 2021
Revised on April 11, 2021
Accepted on May 23, 2021

Publication Information
Journal of Horticulture and Pest Science (JHPS)
ISSN: On Process
Vol.: 1, Issue: 1, Pages: 63-66
Published: June, 2021
doi: 10.46492/JHPS/2021.1.1.8
Web: www.agriinventionjournal.com
URL: *http://agriinventionjournal.com/*
Published by: Agricultural Technology Development Society (ATDS), Ghaziabad, UP, India

Authors Information
Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar

Correspondence Author

Subhash Chandra
Department of Plant Pathology, A. N. D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Email
chandrasubhash75@yahoo.in

Abstract

The Holy Basil (*Ocimum sanctum* L.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. *In vitro* studies revealed that highest inhibition was observed in chemical fungicide Tebuconazole (91.81) followed by other fungicide Mancozeb (78.33) followed by bio-agents *Trichoderma viride* (74.82), *Trichoderma harzianum* (71.77) and *Pseudomonas fluorescence* (69.55) and one botanical Neem leaves (65.55) in respect to control. All the bio-agents produce toxic volatile met-volatile, which reduced the radial growth of the test fungus.

Keywords: Holy Basil, *Fusarium oxysporum* f. sp. *baisilici*, Evaluation, Tulsi

Introduction

The Holy Basil (*Ocimum sanctum Linn.*) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Lamiaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L. (Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum sims* (Dulal Tulsi), *Ocimum baisilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke* (Camphor Basil) *and Ocimum americanum* Linn (Hoary Basil) among them holy Basil *(Ocimum sanctum)* has been well known for its therapeutic potential (Prakash and Gupta, 2005). The chemical constituents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*., 2004).

Article Citation

Chandra, S., Rajvanshi, N. K., Kumar, A. (2021) *In vitro* evaluation of bioagents, botanical and fungicides against *Fusarium oxysporum* f. sp. *baisilici*, *Journal of Horticulture and Pest Science*, 1(1): 63-66 (June: 2021). doi:10.46492/JHPS/2021.1.1.8

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(9): 1886-1887

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 1886-1887
© 2021 TPI
www.thepharmajournal.com
Received: 02-07-2021
Accepted: 05-08-2021

Rahul Singh Raghuvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Abhishek singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Shiv Pratap Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vivek Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Rahul Singh Raghuvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Screening of mungbean [*Vigna radiata* (L.) Wilczek] genotypes for resistance against Cercospora leaf spot under field conditions

Rahul Singh Raghuvanshi, Subhash Chandra, Abhishek singh, Shiv Pratap Singh, Vivek Singh and Neeraj Kumar Rajvanshi

Abstract
Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India it is third most important pulse crop after chickpea and pigeonpea. Mungbean is an important short duration grain legume which is grown in different parts of the country, for grain and green manuring. It is an outstanding source of easily digestible proteins with low flatulence, which balances the staple rice diet in Asia. The mungbean crop is infected by a large number of pathogens such as fungi, bacteria, virus and nematodes in which mungbean Cercospora leaf spot causes significantly losses. Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, one hundred genotypes of mungbean were tested for the resistance against Cercospora leaf spot during *Kharif* 2019 in field condition. Out of total test entries screened 2 genotypes *viz*., SKNM 1502, COGG 13-39 were found highly resistant.

Keywords: leaf spot, cercospora, mungbean, *Vigna radiate* (L.) Wilczek

Introduction
The mungbean (*Vigna radiata* L., Wilczek), alternatively known as the green gram, maash or mungbean, Sanskrit mudga, is a plant species in the legume family. Mungbeans are one of many species recently moved from the genus *Phaseolus* to *Vigna*. The disease starts appearing about 30 days after sowing, depending upon day and night temperature and relative humidity. The main symptom of this disease is formation of angular lesions, on leaves which are grey to brown with radish brown margin. Similar spots also occur on branches and pods. The numbers of leaves spots are more but smaller in case *Cercospora canescens* than *Cercospora cruenta*. In severe case the spots are coalesce and leave are looks like burn. The fungus causes severe leaf spotting and defoliation at the flowering and pod formation. Disease also causes reduction in pod size and grain yield.

Methods and Materials
Seeds of mungbean genotypes were obtained from Indian Institute of Pulses Research, Kanpur and Pulse Section. The field experiment was conducted at Department of Genetics and Plant Breeding, A.N.D. University of Agriculture and Technology. Kumarganj, Ayodhya. Total one hundred genotypes (Table 1) were evaluated in R.B.D. with three replications during *Kharif* season of 2019. Two rows of 4m length spaced 30 cm apart with plant to plant distance of 15 cm., After every genotypes, one row of Kopergoan (*Cercospora* leaf spot susceptible variety of mungbean) was planted and the experimental plot was also surrounded by two rows of Kopergoan to ensure uniform spread of the disease. Observations on disease severity were recorded at 15 days interval, starting with first appearance of symptoms till the maturity of crop using 1-9 rating scale of Mayee and Datar (1986). After germination, observations were recorded regularly up to 30 days for the first appearances of the disease *i.e.* Cercospora leaf spot. The disease was recorded by using 1-9 scale as described in.

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(9): 188-190

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 188-190
© 2021 TPI
www.thepharmajournal.com
Received: 12-06-2021
Accepted: 20-08-2021

Abhishek Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

VP Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vivek Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rahul Singh Raghuvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Reaction of mungbean [*Vigna radiata* (L.) Wilczek] genotypes against web blight caused by *Rhizoctonia solani* (Kuhn)

Abhishek Singh, VP Chaudhary, Subhash Chandra, Vivek Singh, Rahul Singh Raghuvanshi and Neeraj Kumar Rajvanshi

Abstract
The present investigation aimed to identify resistance in Mungbean [*Vigna radiata* (L.) Wilczek] against Web blight caused by *Rhizoctonia solani* (Kuhn) in a field condition. The trial was conducted at Genetics and Plant Breeding Farm of Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya. One hundred genotypes were screened in the summer season of the year of 2019-2020. The severity of was recorded following 0-9 scale. The Mungbean genotypes evaluated were grouped into different categories based on disease reaction, out of one hundred genotypes were screened for their reaction to web blight (*Rhizoctonia solani*) in the field in field condition. It is clear that out of total test entries screened. One genotype *viz.*, Pusa 1771 was found resistant, while three genotypes *viz.*, Pant M-6, VGG16-055, KMP17-19, were recorded moderately resistant. While twenty three genotypes were noticed moderately susceptible. Twenty two genotypes were found susceptible and twenty one genotypes were documented susceptible. As well as twelve were found highly susceptible. While two genotypes *viz.*, K 851, AKM 12 – 28 were noticed highly susceptible. None of these genotypes was found free from infection. The Mungbean genotypes which were found resistant the could be the choice for resistance against Web blight caused by *Rhizoctonia solani* (Kuhn).

Keywords: Web blight, *Rhizoctonia solani* (Kuhn), Mungbean, *Vigna radiata* (L.) Wilczek

Introduction
Pulses constitute an important ingredient of the predominantly vegetarian diet in Indian. Besides being rich in protein, they also play an important role in sustainable agriculture by enriching the soil through biological nitrogen fixation. These crops lit in various cropping system without disturbing the main crops. Pulses are the main source of protein particularly for vegetarians and contribute about 14 percent of the total protein of an Indian average diet. Production of pulses in the country is far below the requirement to meet even the minimum level of per capita consumption. According to Indian Council of Medical Research (ICMR) optimum requirement of the pulse for a person to maintain his normal health is 104 g per day. However, not even half of this quality is available to people, which is causing malnutrition among the growing people. Therefore, it is necessary that agricultural scientists should evolve the strategy of increasing the production of pulses to meet the protein requirement of increasing population of the country.

Mungbean [*Vigna radiata* (L.) Wilczek] is primarily a rainy season crop but with the development of early maturing varieties, it has also proved to be an ideal crop for spring and summer season. Mungbean is an excellent source of protein (24.5%) with high quality of lysine (460 mg/g N) and tryptophan (60 mg/g N). It has also remarkable quantity of ascorbic acid when sprouted and also contains riboflavin (0.21 mg/ 100 gm) and minerals (3.84 g/100g). Mungbean, being a short duration crop, it is suitable in various multiple and inter-cropping systems. After picking of pods, mungbean plants may be used as green fodder or green manure. Beside these, the crop also enriches soil by fixing atmospheric nitrogen. Among the pulses, mungbean [*Vigna radiate*: (L) Wilczek] also known as green gram or golden gram is one of the most important short duration pulse crops of India and grown in kharif, spring and summer seasons. Mungbean plant possess deep root system which binds soil particles and thus prevent soil erosion. Mungbean is mainly used as dehulled grain, hulled (dal), husked and dehusked dal. Soaked and sprouted grains are used as salad. It is also used for various culinary purposes.

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(9): 256-262

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(9): 256-262
© 2021 TPI
www.thepharmajournal.com
Received: 17-06-2021
Accepted: 27-08-2021

Abhishek Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

VP Chaudhary
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Shiv Pratap Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rahul Singh Raghuvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vivek Singh
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Efficacy of botanicals and bio-agents against web blight caused by *Rhizoctonia solani* (Kuhn) of Mungbean *in vitro*

Abhishek Singh, VP Chaudhary, Subhash Chandra, Shiv Pratap Singh, Rahul Singh Raghuvanshi, Vivek Singh and Neeraj Kumar Rajvanshi

Abstract
Web blight caused by *Rhizoctonia solani* (Kuhn) is one of the most important fungal diseases which appear every year in varying intensity and causes heavy reduction in yield. Though the web blight could be managed by the use of fungicide but due to the emergence of several problems like environmental pollution. Residual effect in grains, killing non targeted organisms its use should be discouraged. Hence, for minimizing the losses caused by web blight need in-expensive and environmentally safe management practices. Several botanicals and Bio-agents have been found effective against web blight of mungbean caused by *Rhizoctonia solani*. The botanicals were tested at different doses like 5.0, 7.5 and 10.0 per cent against web blight of Mungbean. Where 10.0 per cent concentration was found most effective which inhibited maximum per cent growth of fungus *i.e.* Garlic (82.53%) and followed by Ginger, Neem, Onion, Tulsi, Clerodendron and Sadabahar. However Per cent Inhibition in all treatments differed significantly to each other. The maximum per cent inhibition was obtained in 5.0, 7.5 and 10.0 per cent concentration in Garlic. Followed by Ginger after 48 hours of incubation. It was very clear from the studies that effectively of extracts increased with the increase in concentration and time of incubation. The per cent inhibition was also higher in *T. viride* (59.13, 68.47 and 71.78 per cent) and *T. harzianum* (49.35, 57.75 and 56.66 per cent) significantly inhibition the growth of *R. solani* as compared to control at 24, 36 and 48 hours of incubation. *Trichoderma. viride* was better in inhibiting radial growth of *R. solani* as compared to *T. harzianum in vitro*.

Keywords: Botanicals, bio-agents, *Rhizoctonia solani*, Mungbean

Introduction
Pulses constitute an important ingredient of the predominantly vegetarian diet in Indian. Production of pulses in the country is far below the requirement to meet even the minimum level of per capita consumption. According to Indian Council of Medical Research (ICMR) optimum requirement of the pulse for a person to maintain his normal health is 104 g per day. However, not even half of this quality is available to people, which is causing malnutrition among the growing people. Therefore, it is necessary that agricultural scientists should evolve the strategy of increasing the production of pulses to meet the protein requirement of increasing population of the country.

In 1924, web blight was reported for the first time on mungbean from Philippines (Nacien, 1924) [10]. While in India, Dwivedi and Saksena (1974) [4] first reported it on mungbean from Kanpur, Uttar Pradesh. Further, it has also been reported from Assam (Saikia, 1976), Punjab (Bains *et al.*, 1988) [2], Madhya Pradesh (Tiwari and Khare, 1998) [12], Bihar, Rajasthan, Haryana, Himachal Pradesh and Jammu & Kashmir (Anonymous, 2004) [1]. The pathogen causes huge losses in yield of mungbean and urdbean in India (Dubey 2003) [3].

Web blight caused by *Rhizoctonia solani* (Kuhn) is one of the most important fungal diseases which appear every year in varying intensity and causes heavy reduction in yield. Though the web blight could be managed by the use of fungicide but due to the emergence of several problems like environmental pollution. Residual effect in grains, killing non targeted organisms its use should be discouraged. Hence, for minimizing the losses caused by web blight need in-expensive and environmentally safe management practices. Several botanicals and Bio-agents have been found effective for management of different crops including web blight of mungbean caused by *Rhizoctonia solani*.

Scanned with CamScanner

The Pharma Innovation Journal 2021; 10(10): 223-226

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 223-226 ©
2021 TPI
www.thepharmajournal.com
Received: 03-08-2021
Accepted: 19-09-2021

Kumari Punam
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SKS Rajpoot
Department of Entomology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Manish Maurya
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rajan Kumar
Food Corporation of India, Regional office, Vijayawada, Andhra Pradesh, India

Ujjal Kumar Ghosh
Department of Botany, Jai Prakash University, Chapra, Bihar, India

Corresponding Author
Subhash Chandra
Department of Plant Pathology, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of post-harvest treatments on quality attributes i.e. titratable acidity, ascorbic acid and Consumers acceptability of Langra mangoes (*Mangifera indica* L.) during storage

Kumari Punam, Subhash Chandra, SKS Rajpoot, Manish Maurya, Rajan Kumar and Ujjal Kumar Ghosh

Abstract
The effect of calcium salts (calcium nitrate and calcium chloride) and Gibberellic acid on quality attributes and consumer's acceptability of Langra mangoes during storage was examined. The fruits were treated with $Ca(NO_3)_2$ at the concentration of 1,2 and 3 per cent, $CaCl_2$ at the concentration of 1,2 and 3 per cent and GA_3 at the concentration of 50, 100 and 150 ppm. Water treated fruits were taken as control. Data were recorded in respect of Titratable acidity, ascorbic acid contents under influence of these treatments. Sensory evaluation was also conducted to assess the consumer's acceptability of treated fruits. All treatments were found effective in maintaining the higher level of these quality attributes as well as the consumer's acceptability of fruits during entire course of the experiment. At end of trial, $Ca(NO_3)_2$at 2% was proved as the best treatment in respect of Titratable acidity and was able to maintain the level of these up to 0.156%. In case of ascorbic acid content and organoleptic scoring GA_3 100 ppm was proved the best. It was able to maintain the level of ascorbic acid up to 27.00 mg/100 gram of pulp and secured an organoleptic score of 83 at the end of experiment.

Keywords: Mango, Langra, calcium nitrate, calcium chloride, ga_3, acidity, ascorbic acid, sensory evaluation

Introduction
Mango (*Mangifera indica* L.), the king of fruits belongs to the family Anacardiaceae. Among the fruits of universal importance, mango is placed on top and is the most popular fruit among millions of people. Mango is fifth widely produced fruit crop of the world after bananas, apples, grapes and oranges. Mango is grown throughout the length and breadth of the country except the temperate and arid regions. The number one mango producing country in the world is India. It contributes approximately 50% of the global mango supply. In India, during 2015-16, it was grown in an area of 2.209 million hectares with a production of 18.643 million tonnes and productivity of 8.4 tonnes/ hectare (Anonymous, 2017) [2].
Mango fruit is an excellent source of Vitamin-A, beta-carotene, alpha-carotene, and beta-cryptoxanthin. It is also a very good source of vitamin-B6 (pyridoxine), vitamin-B9 (folate), vitamin-C (Ascorbic acid) and vitamin-E (Anonymous, 2018) [3]. 100 g of fresh fruit provides 765 IU or 25% of recommended daily levels of vitamin-A. Among the cultivated varieties of Bihar, the variety Langra is most famous and is one of the most popular cultivars of India (Khara *et al*, 2016) [9]. In domestic market this variety has good demand and is able to fetch highest price in the market of Bihar. However, owing to its highly perishable nature and below average keeping quality, export potential of this variety is yet to be capitalised.
Mango showed degradation in quality owing to its high perishability and climacteric pattern of respiration. This massive reduction in the level of quality attributes of fruits is due to fact that sugars along with other organic acids are primary substrate for respiration (Wills *et al*., 1980) [16]. Therefore, a critical examination becomes imperative to slow down the process of respiration and to maintain the quality parameter for an enhance period of time in order to facilitate longer transportation and extended availability of quality fruits in the market.
Earlier efficacy of pre and post-harvest applications of certain chemicals and growth hormones in maintaining the quality of fruits during storage has been established. Pre-harvest sprays of calcium compounds and GA_3 significantly retained more sugar content and ascorbic acid in mango fruits along with better consumer acceptability during storage (Rani and Brahmachari,

Scanned with CamScanner

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

USE OF DIFFERENT DOSES OF SYSTEMIC FUNGICIDE (PROPICONAZOL) FOR MANAGEMENT OF FOLIAR BLIGHT DISEASES OF BARLEY

SANTOSH KUMAR, S.P.SINGH, SUBHASH CHANDRA, ASHOK KUMAR AND RAMESH CHAND*
Department of Plant Pathology, Department of Nematology*, Narendra Deva University of Agriculture & Technology Kumarganj, Ayodhya, U.P. 224229.

Abstract

Barley crop suffers from a number of fungal foliar diseases which cause heavy yield loss. Investigations were therefore, conducted to record the disease severity and avoidable yield loss caused by different foliar blight pathogens and fungicidal management against these diseases. Field trial conducted and established 2 sprays of propiconazole (Tilt 25 EC) @ 1.0, 0.75 and 0.50 l/ha each at boot leaf and soft dough stages as most effective for managing foliar blight of highly susceptible barley variety RD 2503. It resulted in 40.55, 48.77 and 59.30 per cent disease severity, 37.13, 36.96 and 32.75q/ha yield and 33.32, 33.03 and 24.42 per cent avoidable yield loss. It was significantly followed by treatments having single spray of propiconazole @ 1.0, 0.75 and 0.50 l/ha at boot leaf stage with disease intensity 56.94, 63.60, 69.99 per cent, yield 34.56, 32.43, 26.13 q/ha and 28.38, 23.70, 0.282 per cent avoidable yield loss.

Keywords: Foliar blight, fungicidal management, propiconazole

Introduction

Barley (*Hordeum vulgare* L.) is one of the important crops of present era due to its superior nutritional qualities and satisfactory yield in problematic soil. It is grown under a wide range of environmental conditions, cooler climates, during the growing seasons, and well drained light to heavy loam soil being most suitable. Barley is a crop of international importance and serve mainly as staple food, feed to livestock and poultry, as malt for manufacture of bear and other liquors like whisky, brandy etc. Foliar blight causing pathogens viz., *Bipolaris sorokiniana, Alternaria alternata, Drechslera graminea* and *Drechslera teres* are most destructive pathogens of barley and cause severe yield loss. The management of foliar blight pathogens is more effective by using different doses of propiconazole (Tilt 25 EC) sprayed at different crop growth stages. The chemical control of these pathogens therefore, is alternative possibility. Propiconazole as a effective chemical against foliar blight diseases after six to some years.

Materials and Methods

The experiment having following details, were conducted with view to work out an effective fungicidal management schedule for the disease. Two sprays of propiconazole (Tilt 25 EC) @ 1.0 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @ 1.0 l/ha, at boot leaf stage. Two sprays of propiconazole (Tilt 25 EC) @ 0.75 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @0.75 l/ha, at boot leaf stage. Two spray of propiconazole (Tilt 25 EC) @ 0.50 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @ 0.50 l/ha, at boot leaf stage. Two spray of water @ 1000 l/ha, each at boot leaf and soft dough stages and untreated (check). Initiation of the disease, disease intensity after 15 and 30 days spray of Tilt following Kumar *et al.*,1998, double digit scale, 1000-grain weight (test weight) and yield (q/ha).

Comparison between all the 8 treatments was made based on means of relevant parameters. Severity recorded on double digit scale, rating was averaged for leaf and next lower leaf as per (Dubin *et al.*, 1998) formula, which served as means of observation. Avoidable yield losses will be calculated by the formula given below:

$$AYL = \frac{YP - YU}{YP} \times 100$$

Where,
YP = Yield under protected condition
YU = Yield under unprotected condition

Per cent disease intensity (PDI) was calculated by employing the formula:

$$PDI = \frac{\text{Sum of total numerical rating}}{\text{Total number of leaves examined} \times \text{highest rating}} \times 100$$

Results and Discussion

Foliar blight of barley caused by *Bipolaris sorokiniana, Alternaria alternata, Drechslera graminea* & *Drechslera teres* was managed by using different doses of propiconazole (Tilt 25 EC) sprayed at different crop growth stages. Disease severity, thousand grain weight, yield quintal per hectare and avoidable yield loss was recorded in each treatment separately. All the treatments except water spray were found significantly effective in reducing the disease severity over untreated check. The propiconazole, with disease intensity of 40.55 per cent proved most effective when sprayed @ 1.0 l/ha, both at boot leaf and soft dough stages. Similar sprays @ 0.75 l/ha with a disease intensity of 48.77 per cent were next to follow. It was significantly followed by treatments having single spray of propiconazole @ 1.0 l/ha, at boot leaf stage and two sprays of 0.50 l/ha, each at boot leaf and soft dough stages (Table 1).

The treatments have their significant impact on the yield of barley grains over untreated check and water spray. The treatment, two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages, with 37.12 q/ha grain yield gave significantly higher yields over rest of the treatments followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages with 36.12 q/ha grain yield, but both were at par. These were followed by single spray of propiconazole @ 1.0 l/ha, at boot leaf stage, two sprays @ 0.50 l/ha, each at boot leaf and soft dough stages, and single spray @ 0.75 l/ha at boot leaf stage with grain yield of 34.56, 32.75 and 32.43 q/ha respectively. Single spray @ 0.50 l/ha at boot leaf stage with a yield of 26.13 q/ha were recorded least effective amongst all the treatments and also at par with untreated check and water sprayed.

Data gathered on account of test weight of barley grains. Approximately similar results were also recorded in case of test weight. Two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages gave significantly best performance (40.52 g) over all the treatments and untreated check followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages but both were at par. Single spray of propiconazole @ 1.0 l/ha, at boot leaf stage, single spray @ 0.75 l/ha and two sprays of propiconazole @ 0.50 l/ha, each at boot leaf and soft dough stage were the second performer which gave 37.91 g, 37.10 and 37.46 g test weight respectively and all were statistically at par. All the treatments of propiconazole were significantly superior over untreated check and water sprays. Maximum loss of 33.32 per cent in grain could be avoided with two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages, followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages which avoided a loss of 33.03 per cent in grains. Minimum avoidance of loss of grains (0.28 per cent) was recorded with single spray of propiconazole @ 0.50 l/ha, at boot leaf stage. All the treatments propiconazole found significantly effective in reducing the disease severity. Propiconazole at concentration of 1.0 l/ha sprayed at boot leaf and soft dough stages, proved significantly superior in managing leaf blight intensity over check and all other treatments. The propiconazole, with disease intensity of 40.55 per cent proved most effective when sprayed @ 1.0 l/ha, both at boot leaf and soft dough stages. Similar sprays @ 0.75 l/ha with disease intensity of 48.77 per cent were next to follow. It was

Scanned with CamScanner

VOL. VIII, ISSUE SPECIAL(E) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

RESPONSE OF PHOSPHOGYPSUM TO VARIOUS CULTIVARS OF FODDER OAT (*Avena sativa* L.) IN SODIC SOILS

P. Pal, Suresh Kumar*, S. F. A. Zaidi, R. S. Yadav, Subhash Chandra Ram Bharose and Ramesh Chand
Department of Soil Science and Agricultural Chemistry
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U. P.)
224 229

Abstract

Oat is one of the most important cereal fodder crops of Rabi season. It provides soft and palatable fodder. Its fodder, on dry matter basis contains 10.0 -11.5 % crude protein, 55-63 % neutral detergent fiber, 30-32 % acid detergent fiber, 22.0-23.5 % cellulose and 17-20 % hemicelluloses when harvested at 50 % flowering stage of crop. Oat is also used as straw, hay or silage. Total world area under oats is approximately 13.9 million hectares. The production of oat is not being fully exploited because of the lack of proper information on its optimum fertilizer requirement. Among the different production factors, fertilizer application is one of the most important factors in limiting the production of oat crop.

Introduction

Phosphogypsum is a byproduct of all diammonium phosphate plants. Every matric tons (MT) of phosphoric acid manufactured generates 5 MT of phosphogypsum. There is now an estimated stock of about 125 lakh MT of byproduct phosphogypsum in the country. Its agricultural use started only very recently with the onset of calcium and sulphur deficiency in oat grown mostly in light textured soil. Its utilization is however very much restricted because of lack of knowledge on its use, appreciation of benefit in different crops and anticipated environmental problem associated with its use. Phosphogypsum contains 16% S, 22% Ca and 0.71% P_2O_5. Pure gypsum ($CaSO_4$) contains 18.6% S and 21% Ca, while commercial agricultural grade gypsum of 70-80% purity contains 13-15% S and 40% CaO. Sulphur is now recognized as the fourth major plant nutrient after nitrogen, phosphorus and potassium. Crops in general require as much sulphur as they need phosphorus. Sulphur deficiencies have been reported in soil from several state of India and importance of sulphur fertilization in increasing crop yield and product quality is being increasingly recognized. It performs many important functions in the plants. It is best known for its role on the synthesis of protein and vitamins. It is constituent of amino acids and thus vital for production. Sulphur is associated with the production of crop of superior nutritional quality. Since the quality of forage crop is important for their utilization by live stock, hence sulphur fertilizer is of much important in forage production. It enhances the effects of other nutrients also. The effect of sulphur on yield and crop quality is further enhanced where it interacts positively with other nutrients. Reports on the sulphur phosphorus interaction have been conflicting since both positive and negative interactions have been observed (Kanwar and Mudahar, 1985). The sulphur application can ensure the high production of oat. Keeping facts in view an effort has been made to assess the phosphogypsum level which is a byproduct of phosphoric acid plant and on various cultivar of Oat fodder crop.

Material and Methods

The field experiment was conducted to evaluate the effect of phosphogypsum levels to various cultivar of fodder oat crop at Genetics and Plant Breeding Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India during *Rabi* season 2015-2016 under the project of All India Coordinated Research Project (AICRP) on forage crops. The experimental soil having silty loam in texture, pH (1:2.5) 8.59, EC 0.38 dSm^{-1}, Organic carbon 3.1 gkg^{-1}, available nitrogen 173.4, phosphorus 14.80 and potassium 195.10 $kgha^{-1}$. The twelve treatment were comprised of one time application of four levels of phosphogypsum on basis of sulphur content (0, 125, 250 and 375 $kgha^{-1}$) with three cultivar viz. NDO-1, NDO-2 and NDO-711 in randomized block design replication each treatment thrice. The plant spacing was row to row 25cm and plant to plant 5cm. The phosphogypsum was applied through broadcast and surface incorporation. The half dose of nitrogen @ 100 kg N ha^{-1} though urea, and full dose phosphorus @ 40 kg P_2O_5 ha^{-1} through Diammonium phosphate applied at the time of sowing of the crop. The remaining half dose of nitrogen was top dressed in standing crop at 25 DAS just after first irrigation of the crop. Representative soil samples at initial and after harvest of the crop (0-15cm) of investigation were drawn from individual treatment plot and analyzed with methods described in *Jackson*, 1973. The cutting was done with the help of sickle at 50% flowering stage at 105 DAS. The chlorophyll contents was estimated following the methods of Arnon and Stout (1949) and expressed as mgg^{-1} fresh leaves. The nutrient uptake was calculated with multiplication of dry matter yield by nutrient content in percentage.

Results and Discussion

Growth and fodder yield

Data pertaining to growth and fodder yield are presented in Table-1. Inherent genetic variability in plant was notice among entries. Among the entries of fodder oat crop, the maximum plant height with NDO-711(113.5cm), tillers m^{-2} (397), dry matter accumulation (1273.27 gm^{-2}), green forage yield (515.28 qha^{-1}), dry matter yield (124.33 qha^{-1}), crude protein yield (13.83 qha^{-1}) and chlorophyll content (1.70 mgg^{-1}) which was found significantly superior in respect of plant height, dry matter accumulation, green forage yield, dry matter yield, crude protein yield and chlorophyll content over rest of the cultivars. Among the phosphogypsum levels the maximum plant height (117.9 cm), tillers (391 m^{-2}), dry matter accumulation (1241.78 gm^{-2}), green forage yield (515.2 qha^{-1}), dry matter yield (124.2 qha^{-1}), crude protein yield (14.2 qha^{-1}) and chlorophyll content (1.78 mgg^{-1}) were received with the application of phosphogypsum 375 $kgha^{-1}$ (60kg S ha^{-1}) which was found significantly superior in respect of plant height, dry matter accumulation, green forage yield, dry matter yield, crude protein yield and chlorophyll content with 125 $kgha^{-1}$ and found statistically at par the level of 250 kg ha^{-1} phosphogypsum. Better growth and development of oat plants due to higher levels of phosphogypsum (sulphur) doses would have been due to multiple role of S in protein and carbohydrate metabolism of plants by activating a number of enzymes which participate in dark reaction of photosynthesis hence increases the plant height and dry matter was observed with increased doses of phosphogypsum (sulphur). Similar finding were also reported by Choudhary *et al.* (2013), Varshney *et al.* (2008) and Tanveer *et al.* (2013) Sulphur play an important role in plant metabolism by virtue of being essential constituent of various metabolically active compounds like amino acid, proteins, nucleic acid, porphyrins (chlorophyll), enzyme and co-enzyme. Constituent of chlorophyll it is important for photosynthesis. It influences the rate of cell division and their enlargement and hence tends to rapid growth of meristemetic tissue. Similar finding were also reported by Shukla and Menhi (2004).

Nutrient uptake

The data with respect to nutrient uptake by oat fodder presented in Table-2 which revealed that among the entries of fodder oat crop, the maximum nutrients uptake (N 22.78, P 25.98, K 213.37 and S 22.60 kg ha^{-1}) were received with the cultivar NDO-711 which was significantly superior over rest of the entries (NDO-2 and NDO-1). This might be due to the genetic characteristics of variety, resulting

Scanned with CamScanner

doi: 10.5958/0974-0163.2019.00064.8

Evaluation of Pigeon pea genotypes for resistance to *Fusarium* Wilt

Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar, Kumari Punam* and Ramesh Chand**

*Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya – 224 229 (U.P.), *Department of Botany, J. P. University Chhapra (Bihar)*
***Department of Nematology, ND.U.A.&T., Kumarganj, Ayodhya – 224 229(U.P.), India*
<chandrasubhash75@yahoo.in>

Pigeon pea (*Cajanus cajan* L.) is widely adaptable to wide variety of climate and is one of the important legume crops of tropics and subtropics. It played a major role in nutritional security for the people taking cereal based diet. Beside their dietary value and nitrogen fixing ability, pulses also play an important role in sustaining intensive agriculture by improving physical, chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeon pea in India leading to heavy production losses. The *F. udum* is host specific to pigeon pea (Patel *et al.*, 2011) and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. For developing resistant varieties, resistant source are the basic requirement. Therefore, the present investigation was undertaken.

Seeds of 58 germplasm of Pigeon pea were obtained from the Department of Genetics and Plant Breeding, N.D.U.A.&T., Ayodhya and ICAR-IIPR, Kanpur. The germplasms were screened under sick plot technique. The plots (sick soil) showed over 90% wilt incidence in susceptible cultivar Bahar of Pigeon pea was used as test variety. After germination, observations were recorded regularly up to 60 days for the appearance of wilt symptoms and severity. The disease was recorded using 1-9 scale for the wilt disease.

Fifty eight germplasms of Pigeon pea were screened for their reaction to *Fusarium udum* in sick plot. It is evident (Table 1) that out of 58, 6 germplasms *viz.*; AKT 201030, IPA 96, IPAF, IPA 204, JSA 59 and WRGE 18 were found resistant, attributing to the higher concentration of phenol as observed by Haldar and Srinivasan (2007), 5 moderately resistant, 10 tolerant, 16 moderately susceptible and 21 germplasm were highly

Table 1. Performance of Pigeon pea genotypes against *Fusarium udum* under field condition (Sick plot technique)

Reaction (Rating scale)	Name of the genotypes
Resistant (1)	AKT201030, IPA96, IPAF, IPA204, JSA59, WRGE18.
Moderately resistant (3)	IPA9F, IPA204, ICP8863, WRGE18, BDN2.
Tolerant (5)	IPA13F, AL1573, H2001-4, HDM04-1, UPAS120, GRG206, JKM197, PT02-9, IPA2F, IPA4F.
Moderately susceptible (7)	IPA12F, WRG123, JKM206, JKM208, PT02-5, PT25-6, AL1514, AL1571, PA325, PT05-37, WPB205, AKT222560, ASI106, JKM209, NDA05-1, WRGE42.
Highly susceptible (9)	IPA11F, IPA14F, IPA15F, IPA34, IPA234, JSA28, PA322, PT01-27, BAHAR, PUSA2006-2, SKN205, WRGE56, CORG990015, PT05-36, IPA1F, IPA3F, IPA5F, IPA5-2, IPA5-3, IPA6F, IPA7F.

Scanned with CamScanner

Short Communication *Ann. Pl. Protec. Sci. 27 (2) : 302-307 (July, 2019)*

doi: 10.5958/0974-0163.2019.00062.4

Identification of Lentil genotypes resistant to *Fusarium oxysporum* f. sp. *lentis*.

Subhash Chandra, Neeraj Kumar Rajvanshi and Ramesh Chand*

*Department of Plant Pathology, *Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya – 224 229 (UP), India*
<chandrasubhash75@yahoo.in>

Date of Receipt: 06.05.2019; Accepted: 16.06.2019

Lentil (*Lens culinaris* Medik L.) is one of the most important pulse crop in India and mostly grown in north east plain zone and central part. It is a diploid and self-pollinated crop which is grown in winter season. Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by

Table 1. Performance of Lentil genotypes against *Fusarium oxysporum* f. sp. *lentis* in field screening during *Rabi* season

Rating scale	Reaction	No. of genotypes	Name of genotypes
1	Highly resistant	49	IPL 534, IPL 224, IPL 328, IPL 223, PL 141, SKUL 2-96, LL 1266, IPL 327,LL 1223, RKL 604-01, RKL 607-01, L 4147, VL 521, LL1114, PL 135, RKL 606-09, PL 117, L 4593, EC 1, PL 146, LH 84-8, LH 08-10, IPL 81, L 4708, VL 145, L 4592, L 4710, HUL 57, KLS 09-5, IPL 321, L 4711, IPL 219, IPL 215, L 4076, IPL 315, IPL 324, IPL 513, IPL 316, IPL 526, IPL 220, IPL 225, PL-129, LL-1231, RLS 113, L-4707, L-4588, VL-142, VL- 143, RLG 147.
3	Resistant	34	NDL 12-1, K-75, IPL 529, RLG-109, VL-138, LL-1136, IPL-319, LL-1187, KLB-104, L-4704, LL-1135, KLS-107, DPL-62, IPL-531, SL-28, KLS 122, L-4702, RLG-112, KLB 314 HPLC-649, PLO-097, LL-1161, L-4076, L-4688, VL-134, NDL7-402, VL- 516, IPL-314, VL-515, DL-11-5, DPL-15, KLS 113, PL 639, LH O7-27.
5	Moderately resistant	15	NDL 12-1, KLB 343, IPL-533, NDL 11-2. NDL-7-401, NDL 6-1-10, RLG-73, IPL-314, VL-133, LL-1020, L-4589, LH 07-27, L-4595, IPL-325, PLO-98.
7	Susceptible	20	IPL 326, IPL 222, LL 1161, RLG 156, IPL 533, IPL 406, DPL 15, IPL-219, IPL-406, IPL-81, LL1210, PL-101, PL-104, VL- 521, LH-484-8, LH 08-10, NDL-11-1, L-4591, DPL-62, KLB102.
9	Highly Susceptible	32	IPL 532, RL 3, LL 1255, NDL 12-2, SKUL 9, RKL 604-5, IPL 529, LL 1203, L 9-12. IPL 220, IPL 325, IPL 221, KLS 113, RLG 147, VL 522, KLB 121, DPL 62, L 4709, LL 1203, RVL -48, KLB-314, L- 4590, DL-11-4, L-4706, PL-122, PL-099, IPL-221, IPL-318, IPL-532, IPL-215, HUL-57, RL-G109.

Scanned with CamScanner

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3825-3829

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-11 pp. 3825-3829
Journal homepage: http://www.ijcmas.com

Original Research Article

Management of *Fusarium wilt* of lentil through seed treatment with fungicide, botanicals and bio-agents alone or in cocktail

Subhash Chandra[1*], Rajeev Kumar[1], Ajay Kumar[2], Abhimanyu[3], Ramesh Chand[1] and Rajendra Prasad[1]

[1]Department of Plant Pathology,
[2]Department of Plant Pathology, Amar Singh P.G. College, Lakhavaoti, Bulandshahar, Uttar Pradesh, India
[3]Department of Plant Protection, Krishi Vigyan Kendra, Farrukhabad, Chandra Sekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India
**Corresponding author*

ABSTRACT

Fusarium wilt is one of the major diseases in lentil crop which causes a significant yield loss. The present study aimed to manage the *Fusarium wilt* of lentil through seed treatment with fungicide, botanicals and bio-agents alone or in combination which is carried out at Student Instructional Farm of ANDUAT, Kumarganj, Ayodhya. It was observed that Minimum disease incidence was found in T_8 Metalaxyl 8% + Mancozeb 64% + Neem leaf extract (10%) + *T. viride* (14.13 %) with per cent disease control (82.76) followed by T_3 Metalaxyl 8 % + Mancozeb 64 % + *Trichoderma viride* (15.85 %) having PDC (80.67), T_2 Metalaxyl 8 % + Mancozeb 64 % + *Trichoderma harzianum* (22.37%) having PDC (72.71), T_7 Metalaxyl 8% + Mancozeb 64% + Neem leaf extract (10%) (28.84%) having PDC (64.82).

Keywords

bio-agents, botanicals, Fusarium, management, wilt

Introduction

Lentil (*Lens culinaris* Medik) commonly known as Masur was among the first crop domesticates and has become an important pulse crop in the farming and food system of many countries globally (Sarker and Erskine, 2006). Lentil also known as 'Poor man's meat' as it is rich in nutrients, include 60-67% carbohydrates, 20-36% protein, <4% lipid, and 2-3% ash on dry weight basis (Bhatty, 1988). Major lentil growing states in India are Madhya Pradesh (42.50%), Uttar Pradesh (31.25%), West Bengal (9.38%) and Bihar (8.75%). In India, lentil was grown in 1.49 mha with production of 1.61 mt with an average production of 1006 kg/ha (Anonymous, 2018).

Among biotic factors disease are major constraint in lentil production. Among the fungal diseases, Fusarium wilt of lentil caused by *Fusarium oxysporum* f.sp. *lentil* is a major threat in lentil production worldwide (Bhalla *et al.*, 1992). In India, this disease causes significant yield losses in various states of India where lentil is grown. The fungus is soil and seed borne and also

Scanned with CamScanner

The Pharma Innovation Journal 2021; SP-10(12): 368-371

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(12): 368-371
© 2021 TPI
www.thepharmajournal.com
Received: 16-10-2021
Accepted: 18-11-2021

SKS Rajpoot
Crop Research Station,
Masodha, A.N.D.U.A.T.
Ayodhya, Uttar Pradesh, India

S Dixit
Crop Research Station,
Masodha, A.N.D.U.A.T.
Ayodhya, Uttar Pradesh, India

V Prasad
Crop Research Station,
Masodha, A.N.D.U.A.T.
Ayodhya, Uttar Pradesh, India

SP Giri
Crop Research Station,
Masodha, A.N.D.U.A.T.
Ayodhya, Uttar Pradesh, India

RA Singh
Crop Research Station,
Ghaghraghat, A.N.D.U.A.T.
Bahraich, Uttar Pradesh, India

N Parkash
Crop Research Station,
Ghaghraghat, A.N.D.U.A.T.
Bahraich, Uttar Pradesh, India

AL Upadhay
Crop Research Station,
Ghaghraghat, A.N.D.U.A.T.
Bahraich, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology
A.N.D.U.A.T. Kumarganj,
Ayodhya, Uttar Pradesh, India

Corresponding Author
SKS Rajpoot
Crop Research Station,
Masodha, A.N.D.U.A.T.
Ayodhya, Uttar Pradesh, India

Evaluation of insecticides and biopesticides against *Scirpophaga incertulas* (Walker), leaf folder (*Cnaphalocrosis medinalis*) and green leafhopper in basmati rice

SKS Rajpoot, S Dixit, V Prasad, SP Giri, RA Singh, N Parkash, AL Upadhay and Subhash Chandra

Abstract
The field trials were carried out at A.N.D.U.A.T. Crop Research Station, Masodha Ayodhya, during kharif 2019 and 2020 to evaluate the efficacy of four combination modules/treatments consisting of three insecticides Chlorantraniliprole 20% SC, Cartap hydrochloride 50% SC and Triflumezopyrim 10% SC, one commercial neem formulation - Neemazal and two oils - Neem and Eucalyptus oil procured from IIRR, Hyderabad (Telangana) were compared along with untreated control (only water spray). There were significant differences in dead heart damage among the treatments. All insecticides treatment module recorded the lowest mean damage of white ears 1.3% when compared to 28.8% in untreated control. Among other treatments, neemazal, eucalyptus oil and cartap hydrochloride combination showed lowest mean infestation of 4.1% DH. Among modules, all insecticides module was found to be the best with 1.3% mean white ear damage followed by neemazal, eucalyptus oil and cartap hydrochloride module with 4.1% WE. All insecticides module was the most effective treatment showing mean leaf damage of 2.45% followed by treatment with neemazl, Eucalyptus oil and cartap hydrochloride (4.95% DL) when compared to untreated control (17.2% DL). All insecticides combination was the most effective treatment of Green leafhopper showing mean population of 3.0 followed by neeamazal, eucalyptus oil and cartap hydrochloride combination (17.7)) and were superior to control (61.7 hoppers/10 hills). All insecticides treatment Chlorantraniliprole, Cartap hydrochloride, Triflumezopyrim recorded the highest grain yield of 3260 kg/ha with 237.1% increase over control followed by neemazal, neem oil and cartap hydrochloride with 2350 kg/ha (143.01% IOC). All the treatments were significantly superior to control plot which showed a yield of 967 kg/ha. All insecticides combination minimized the yield loss in basmati rice.

Keywords: basmati rice, stem borer, leaf folder, green leafhopper, grain yield

Introduction

Rice (*Oryza sativa* L.) is an important staple food crop for more than two third of the population of India and more than 65 per cent of the world population (Mathur *et al*., 1999) [10]. India is the largest rice growing country, it accounts for more than 40% food grain production. Introduction and wide adoption of basmati rice varieties has led to sever incidence of yellow stem borer in addition to the existing leaf folder menace on the rice crop all over India. There are over 70 pests infesting rice in India and 20 are of regular occurrence (Patha, 1975). The pest causes 25-30% damage to rice crop (Lal, 1996) [7]. Almost 20 insects are considered as rice pests of economic importance that include stem borers, leaf folder,gall midge, defoliators and vectors like leafhoppers and plant hoppers that cause direct damages and transmit various diseases Among the major pest attacking rice crop the stem borer, *Scirpophaga incertulas* (Walker) is the number one pest, which attack the crop both at vegetative and reproductive stages (Pasalu *et al*., 2002) [12]. All plant parts of basmati rice are vulnerable to insect infestations from sowing to harvest with an estimated 25-30% yield loss annually (Khan *et al*., 2003) [11]. Scented varieties are comparatively more preferred by insect pests (Khuswaha, 1994) [6]. Among these insect pests stem borers viz., yellow stem borer Scirpophaga incertulas (Walker), white stem borer Scirpophaga innotata (Walker), pink stem borer Sesamia inferens (Walker) and leaf folder Cnaphalocrocis medinalis (Guenee) are important. The rice green leafhoppers (GLH), are one of the most devastating rice pests throughout the rice growing areas of Asia (Q.M.A. Razzaque *et al*. 1985, E.A. Heinrichs, *et al*

Scanned with CamScanner

The Pharma Innovation Journal 2022; SP-11(2): 376-380

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(2): 376-380
© 2022 TPI
www.thepharmajournal.com
Received: 28-12-2021
Accepted: 30-01-2022

Abha Singh
College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Pragya Ojha
SMS Krishi Vigyan Kendra, Banda University of Agriculture & Technology, Banda, Uttar Pradesh, India

Sumant Pratap Singh
SRF, Department of Crop Physiology, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Namita Joshi
Dean, College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Abha Singh
College of Community Science, A.N.D.U.A.T, Kumarganj, Ayodhya, Uttar Pradesh, India

Income generation for sustainable development of rural women

Abha Singh, Pragya Ojha, Sumant Pratap Singh and Namita Joshi

Abstract
Women constitute about 50% of total population, yet their status in the society pitiable. They put in 15 hours of work daily but their wages are less than men. The income generation activities undertaken by women are yet to prove its impact on them or it is more a self employment activity rather than a substantial source of income. Therefore there is a need to study if these micro income generating activities provide empowerment to rural women. The objective of this study is to find out if income generating activities under taken by rural women have increased their participation in decision making process. In this study income generating activity has been treated as independent variable and women empowerment as dependent variable. The study was conducted in Sultanpur district of Uttar Pradesh (U.P.) and both income generating and non income generating 150 women from each group were selected as sample. The pace of empowerment may be due to small amount of income generated. As a result of this, U.P. (Uttar Pradesh) government initiated several projects. Under this scheme women are encouraged to undertake some income generating programmes to raise their income which will their self confidence, bargaining power, promote stronger household food security and investment in children's schooling. From review paste researchers and personal experiences the following model is designed to show how women empowerment takes place. A similar model was tested by Estudillo and Esutka 1988, but model differs in measuring empowerment in terms of women participation in decision making. The study revealed that income earned by women has improved their status and empowerment is taken place but the speed of empowerment is slow.

Keywords: decision making, society, economic, farming, labor, village

Introduction
It is paradoxical that women constitute nearly 50 percent of world population and yet their social economic and welfare status is pathetic. Even today only a fraction of rural women are educated and majority is living under poverty, ignorance, and oppression. They still lack the access to information, science and technology, economic resources, political power and employment avenues. Their employment opportunities are dismal. What ever improvement in women employment is being claimed, it is mostly among urban women while rural women are still far behind and living in poor condition. The activity profile of women reveals that they put in 15 hours of work daily and yet their wages are lower than men. Besides this, they contribute nearly 50 to 70 percent of agricultural labour in farming and when working on own farm they are not paid. Although when they work as a labour on the farm of other farmers, they are paid less wages compared to men. The world community is aware of rural women's plight and four world conferences have been organized and truck load of resolutions have been passed. As a result of this, U.P. (Uttar Pradesh) government initiated several projects, notably DWACRA (Development of Women and Children of Rural Areas). Under this scheme women are organized in self help groups and are encouraged to undertake some income generating programmes to raise their income which will raise their self confidence, bargaining power, promote stronger household food security and investment in children's schooling. According to Cornelia Butler Flora Rural women help in income generation either by earning or by saving.

Critical analysis of the studies reflects that income generation activity should be encouraged for empowering the women. However none of these studies clearly state that the impact of income generation is positive and it has empowered the women. The major issue is how empowerment has been measured in these studies. Therefore, in this study woman participation in various decisions making has been measured in as empowerment.

The second aspect which is yet to be tackled is the feeling of improvement of income and

Scanned with CamScanner

VOL. XII, ISSUE XXXXII, APRIL 2022 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

IMPACT OF SKIN THICKNESS IN RELATION TO PARITY AND LACTATION STAGE ON MILK YIELD IN DAIRY ANIMALS

Durgesh Nandan*[1], P. S. Pramanik[1], K. D. Singh[2], R. P. Diwakar[3] and Vipin Yadav[4]
[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya- 224229, Uttar Pradesh, India
[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya - 224229, Uttar Pradesh, India
[3]Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya - 224229, Uttar Pradesh, India
[4]Department of Veterinary Surgery & Radioligy, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya - 224229, Uttar Pradesh, India

(MS Received: 12.11.2021; MS Revised: 07.12.2021; MS Accepted: 08.12.2021)

MS 2852 **(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT,)**

Abstract

The aim of the present investigation was to examine the effect on haematological profile before and after disbudding in calves. The study was carried out at the Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study haematological parameters (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (103/ µl), Eosinophil (%) and N/L ratio) before and after disbudding in to four groups viz. control (T0), lignocaine (TL), tremadol (TT) and lignocaine + tremadol (TL-T). After medication calves were disbudded by hot iron method. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. Haematological responses recorded before and after disbudding. The results showed that, at 24h, T0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to TT and TL-T groups but significantly different from TL groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in TT group which was statistically similar with TL-T group but significantly differed with TL and TT groups at 6h. The T0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to TT and TL-T groups but significantly different from TL group at 6h. At the same interval, T0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with TL, TT and TL-T groups. At 6h, T0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to TT and TL-T groups but significantly different from TL group. It may be concluded that no significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases TL-T group showed comparatively better performance.

Keywords: *Skin thickness, Lactation stage, Parity, Milk yield, Murrah, Sahiwal, Gir*

Introduction

Dairy animals especially cattle and buffalo play a major role in India because of their higher milk production potential. Moreover, some of the prominent milch breeds are exported to foreign countries like Italy, Brazil etc. for maintaining the people's daily milk needs. In India, milch cattle and buffalo breeds like Sahiwal, Gir, Red Sindhi, Deoni, Murrah, Surti, Mehasana etc. are well adapted to the prevailing environmental conditions. Among all the milch breeds, Sahiwal is considered to be one of the important cattle milch breeds and thrives well in many parts of India. Animals of this breed are known for their ability of heat tolerance, disease resistance and adaptability to low input system. The average milk yield of this breed has been reported between 2,725 and 3,175 kg in a lactation period of 300 days and certain individual cows have been reported to produce as high as 4,535 kg of milk (Sastry and Thomas, 2016). Mostly, dairy breeds of the tropics and subtropics are slow maturing and low milk producers. This is because of partly inherited and partly due to the malnutrition, management and environment to which they are exposed (Das *et al.*, 2003).

Buffaloes play very important role in Indian agriculture. They are the main source of milk, meat and draft power in many parts of the world. In India, the total buffalo population is recorded 108.70 million and about 51% of total milk production is shared by these animals (Livestock Census, Govt. of India, 2019). As there has been an immense increase in the human population, buffaloes therefore hold the greatest promise and potential for milk production. Murrah breed is the most important breed that is known for its high milk yield potential. Murrah breed has been used extensively to improve the milk production of dairy buffalo in other countries like Brazil, Italy, Bulgaria and Egypt. Average milk production in Murrah buffalo varies from 1360 to 2270 kg in a lactation period of 310 days (Sastry and Thomas, 2015). The average milk yield is reported to be 6.5 kg/day while a few individual animals yield as much as 19.1 kg/day. However, the Murrah buffalo named Rani of Lakshmi Dairy Farm in Punjab set a new record by producing 26.33 kg of milk in the 2016 National Livestock Competition and Expo (Watts, 2016). Physical features of Murrah breed such as body size, coat colour, horn shape, udder shape & size, and skin thickness are said to be related with milk production (Mondal and Pandey, 1995; Bhuiyan *et al.*, 2004). The skin of an animal in good condition is relatively thick and skin thickness may indicate an animal's ability to thrive in a given area. Histological structures determining the expand ability, elasticity and density of the skin are associated with milk yield. Moreover skin has a major importance as an organ of adjustment between the animal and its climatic environment. Skin thickness of cattle and buffalo has been measured by various workers (Hossain *et.al.*, 2016; Bharati *et.al.*, 2017). The considerable differences of result by various workers appear to be both biological and metrical in origin. However, the value of measuring cattle skin thickness and examining its relationship with other characters cannot be properly assessed unless skin thickness itself can be measured within reasonable limits of error (Hayman *et al.*, 1966).

Very few reports have been published regarding the relationship of skin thickness with parity and stage of lactation, but it is essential to study further about the skin thickness of dairy breeds. The present study has been, therefore, undertaken to impact of skin thickness in relation to parity and lactation stage on milk yield in dairy animals (Sahiwal, Gir cows and Murrah buffalo).

Materials and Methods

The experiment was conducted at Livestock Farm Complex, College of Veterinary Science & Animal Husbandry ANDUAT

The Pharma Innovation Journal 2021; SP-10(6): 210-214

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(6): 210-214
© 2021 TPI
www.thepharmajournal.com
Received: 01-04-2021
Accepted: 03-05-2021

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Subodh Kumar
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Srivastav
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Veterinary Pharmacology & Toxicology, College of Veterinary Science and Animal sciences, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of stocking density on gait score and mortality in broiler chickens

KD Singh, PS Pramanik, Subodh Kumar, Rajesh Kumar, AK Srivastav and MK Verma

Abstract
The research was conducted to investigate the impact of stocking density (i.e., I.C.A.R., Venky's and Amrit recommendations) on gait score & mortality in broiler chickens. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches. Each batch was subdivided in 3 equal groups namely Gr 1 (I.C.A.R.), Gr 2 (Venky's) and Gr 3 (Amrit). All the birds were raised on pucca floor with saw dust as litter material providing equal managemental practices. Walking ability was accessed at weekly interval up to 6 weeks of observation. The gait scoring system followed in the present study was Modified gait scoring system developed by Garner *et al.* (2002). Daily mortality of birds was recorded in morning hours &mortality rate was calculated weekly. The lowest and highest% of birds showing GS 0 under I.C.A.R. recommendation of stocking density have been found to be 83.93±0.64% (week 4) and 92.86±0.40% (week 6) respectively. Similarly the corresponding proportion of birds showing GS 1 were 6.07±0.78% (week 1) and 13.93±0.64% (week 4) respectively. Comparatively lesser % of birds show GS 2 and the lowest and highest L.S. means % of this were 0.00±0.40% (week 6) and 3.21±0.82% (week 3) respectively. Venky's & Amrit's observation were also similar as I.C.A.R. recommendation has been observed. Overall it has been observed that% of birds showing GS 0 was significantly more in I.C.A.R. followed by Amrit and Venky's during this study. However, highest% of birds showing GS 1 was recorded in Venky's recommendation followed by Amrit and I.C.A.R. Whereas, less than 5% birds exhibited GS 2 in this study in respective of stocking densities. There was no significant difference regarding% of birds with GS 2 in three stocking densities during all the weeks except at week 4. The overall mortality (%) was less than 5% over weeks under each placement densities. No significant difference was observed among mortality rates of broiler chickens under these three stocking densities during all the weeks studied. From present study, this can be concluded that leg health and walking ability was comparatively better under I.C.A.R. recommendation followed by Amrit and Venky's. However, effect of stocking density on mortality was non significant among three stocking.

Keywords: gait score, foot pad lesions, stocking density, mortality and walking ability

Introduction
The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012) [21]. Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.57 percent and 11.44 percent in egg and broiler production, respectively. The value of output from the poultry sector was US$10 billion in 2014 (Rajendran *et al.*, 2014) [25]. Broiler production has been more vibrant than layer production within the poultry sector, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (Index Mundi, 2015) [15]. India is the fourth largest producer of poultry meat in the world, valued at US$ 6.6 billion. Poultry production accounts for about 0.66 percent of India's GDP and 7.72 percent GDP from the livestock sector (Rajendran *et al.*, 2014) [25]. Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014. The per capita availability of poultry meat is 2.8 kg; against recommended level of 11 kg (Rajendran *et al.* 2014 [25]; Index Mundi, 2015 [15]). The main reasons for improved broiler poultry production (Kalamkar, 2012; SAPPI.PP, 2009) [17, 29] are: modernization of production practices; import of pure lines/grandparent stock; least-cost feed formulation; vaccines against major diseases; provision of EAS and other input services; improved quality breeder management; developments in poultry processing; and private sector partnerships through Contract Broiler Farming. It is estimated that 37 percent of broiler production in India is under contracts, and about 78 percent of those contracts are concentrated in southern India (Rajiajwani, 2012) [26].
Gait scores (GS), a parameter used to evaluate walking ability (Kestin *et al.*, 1992; Garner *et*

The Pharma Innovation Journal 2021; SP-10(4): 203-210

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(4): 203-210
© 2021 TPI
www.thepharmajournal.com
Received: 12-01-2021
Accepted: 22-02-2021

Durgesh Nandan
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Gaurav Pandey
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Yadav
Department of Veterinary Surgery & Radioligy, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on relationship between milk yield and skin thickness of dairy animals

Durgesh Nandan, PS Pramanik, KD Singh, RP Diwakar, Gaurav Pandey and Vipin Yadav

Abstract
The aim of the present investigation was to examine the relationship between skin thickness and milk yield. The experiment was conducted at Livestock Farm Complex, C.V.Sc. & A.H., ANDUAT Ayodhya, Ram Newaj Singh Dairy Farm, Kumarganj, Ayodhya (UP) and Gorakhnath Singh Dairy, Baijnathpur Gorakhpur (UP) as per availability of lactating animals (Murrah buffalo, Gir and Sahiwal cows) which was 32 animals of each breed. A total of 96 dairy animals were studied in this experiment in which 32 Murrah buffaloes, 32 Sahiwal cows and 32 Gir cows ranging from first to fourth lactation periods. The dairy animals were selected on daily milk yield and total milk yield were recorded from the records over an average period of 120 days of lactation length. The skin thickness was measured from seven sites or regions namely neck, chest, abdomen, rump, hind quarter, udder and flank of each animal. The result shows that, in Murrah buffaloes the highest average DMY was 8.16 ± 0.52, 8.62 ± 0.55, 8.29 ± 0.78, 8.15 ± 0.55, 8.69 ± 0.77 and 7.86 ± 0.39 litres by animals under thin skin thickness of neck, chest, abdomen, hind quarter, udder and flank regions respectively. In Sahiwal cows, it was observed that the highest average DMY was 7.26 ± 0.31, 7.47 ± 0.65, 7.63 ± 0.48, and 7.69 ± 0.76 litres by animals under low skin thickness of neck, chest, abdomen and udder regions respectively. Where as in Gir cows it was observed that the highest average DMY was 6.23 ± 0.46, 6.06+0.41, 5.96 ± 0.51, 5.06 ± 0.36 and 6.03 ± 0.65 litres by animals under low skin thickness of neck, abdomen, hind quarter, udder and flank regions respectively. However, it was also observed that all the Murrah buffaloes, Sahiwal and Gir cows having thick skin of different regions were found to produce lowest milk yield per day. Least square analysis showed that the relation between DMY and skin thickness of thin, moderate and thick in different regions was found to be statistically non-significant except in flank regions where different types of skin thickness found significant ($p<0.01$). Further it was observed TMY and type of skin thickness in different regions were not found significant ($p<0.01$) except udder and abdomen regions where thick skin TMY were found to be statistically highly significant ($p<0.01$). It may be concluded that, the udder skin thickness was minimum followed by that in ascending order in the neck, chest, abdomen, hindquarter, flank and rump regions of the animals. Further it was evident that Murrah buffalo, Sahiwal and Gir cows under their skin thickness were found to produce more milk, while moderate skin thickness produced more milk and then thick skin thickness produced milk.

Keywords: Skin thickness, murrah, sahiwal, gir, parity, milk yield

Introduction
Dairying is an important enterprise for many countries of the world. As a result it has been an important source of income generation for rural families in the developing countries. With the increase in human population, the demand for milk has also been increased (Tollens *et al.*, 2004) [17]. In India, milch cattle and buffalo breeds like Sahiwal, Gir, Red Sindhi, Deoni, Murrah, Surti, Mehasana etc. Are well adapted to the prevailing environmental conditions. Among all the milch breeds, Sahiwal is considered to be one of the important cattle milch breed and thrives well in many parts of India. Animals of this breed are known for their ability of heat tolerance, disease resistance and adaptability to low input system. The average milk yield of this breed has been reported between 2,725 and 3,175 kg in a lactation period of 300 days and certain individual cows have been reported to produce as high as 4,535 kg of milk (Sastry and Thomas, 2016) [15].
In India, majority of buffalo population belong to the riverine group and the milk production is the main function of these animals. It is reported that about 73.77 % of world buffalo population are found in South Asia. In India, the total buffalo population is recorded 108.70 million and about 51% of total milk production is shared by these animals (Livestock Census, Govt. of India, 2019).

DOI: https://doi.org/10.36811/jvsr.2021.110018 JVSR: November-2021: Page No: 62-69

Journal of Veterinary Science and Research
Research Article Open Access

Study the Haematological parameters and Oxidative stress before and after disbudding in Calves

Shiv Swaroop[1*], Pramanik PS[1], Singh KD[2], Subodh Kumar[2] and Verma AK[2]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya- 224229, Uttar Pradesh, India
[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya - 224229, Uttar Pradesh, India

***Corresponding Author:** Shiv Swaroop, Department of Livestock Production Management, India, Tel: 9936709777; 08004067773; Email: drshivswaroop59@gmail.com

Received Date: *Nov 01, 2021 / **Accepted Date:** Nov 15, 2021/ **Published Date:** Nov 17, 2021*

Abstract

The aim of the present investigation was to examine the haematological profile and oxidative stress before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, ANDUAT, Kumarganj, Ayodhya and nearby villages. Twenty four cattle calves were utilized to study haematological parameters that are Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%), N/L ratio) and oxidative stress before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tremadol (T_T) and lignocaine+tremadol (T_{L-T}). After medication calves were disbudded by hot iron method. The blood samples were collected for haematological parameters & for estimation of LPO (lipid peroxides) as per method described by [1] just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. At 0h, 6h and 24h LPO was significantly different among groups. At 0h, T_0 group showed significantly highest (106.59±0.63) which was significantly different from T_L, T_T and T_{L-T} groups. It may be concluded that no significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However, Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance. At 0h, 6h and 24h LPO was significantly different among groups. At 0h, T_0 group showed significantly highest (106.59±0.63) which was significantly different from T_L, T_T and T_{L-T} groups.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 62-64
© 2020 JEZS
Received: 11-01-2020
Accepted: 13-02-2020

P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Animal Genetics and Breeding, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Verma
Department of Livestock Farm Complex, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Gupta
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

B Singh
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
P Gautam
Department of Livestock Production & Management, C.V.Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens

P Gautam, PS Pramanik, KD Singh, MK Verma, S Gautam, AK Verma, VN Gupta and B Singh

Abstract
The present experiment was conducted to investigate the impact of blue and green monochromatic light in comparison to white LED on the stress reaction and mortality rate of broiler chickens. For a period of 42 days study two hundred forty day old Vencobb 400 straight run commercial broiler chicks were randomly divided into three groups with 2 replicates of 40 in each at the poultry unit of livestock farm complex, College of veterinary sciences and animal husbandry, A.N.D.U.A.T. Kumarganj, Ayodhya, (U.P). In first green-blue group (T_{GB}), the birds were kept on green LED light (GL) and blue LED light (BL) from 1-21days and 22-42 days, respectively. The broiler birds of Group T_W and T_C were kept in white and incandescent LED lights for 42 days, respectively. The findings revealed that the heterophil % differed significantly ($P<0.05$) at 6th week of age when broiler finished their light treatment duration (after shifting from green LED to blue LED at 4th week of age). The ratio of blood heterophil to lymphocyte was also significantly differed ($P<0.05$) at the 6th week of age. The H/L ratio was higher in T_C group (0.37±0.008) whereas, it was lowest in T_{GB} group (0.33±0.456) than T_W group (0.35±0.120) birds at 6th of age. This study indicated that birds were minimum stress level in T_{GB} group than other treatment groups. The mortality rate of broiler chicks was highest in T_W group (6.25%) and lowest in T_{GB} group (3.75%) than T_C group (5%) birds. The results of the present study concluded that, broiler birds under green-blue (1-21d in GL and 22-42d in BL) LED bulb treatment group had significantly ($p<0.05$) lower stress as drawn by a ratio of Heterophil: Lymphocyte, which was highest in incandescent bulb treatment groups followed by white LED groups.

Keywords: Monochromatic light, stress reaction, mortality rate, broiler chicken

Introduction
For the large section of poultry meat consumers, the comprehensive mechanization of the poultry segment has made the broiler meat available in the recent years. Now the broiler meat is far most globally famous animal food product due to its nutritional, sensory and economical properties. It has a high potential to generate foreign exchange earnings through export of poultry products to neighboring countries. The Poultry industry has emerged as the fastest growing segment of the livestock sector both globally as well as in India (Iisa Augustine and Ruchira Shukla, 2015) [6]. Broiler production is one of the most dynamic and fastest growing animal husbandry sub-sectors in India. The total poultry population has increased by 16.81% over in the recent census and the total poultry in the country is 851.81 million. However, in previous census 2012, it was 729.21 million in numbers (Livestock census, 2019) [14]. Due to increasing population growth, urbanization and rising income there is an increasing demand of animal protein source so that chicken meat has shown its fastest growth in last two decades.
Lighting is an important environmental cause in poultry production that is known to affect performance and behavior. Chickens are visually well equipped, and therefore light plays very important role in their wellbeing and productivity. Light is constituted of a wide spectrum of electromagnet (EM) waves. The visible part of the electromagnetic (EM) spectrum is relatively small and is formed of wavelengths from approximately 350 to 800 nm. The eyes of broilers seem to be more sensitive to the broader spectrum than humans and these can perceive ultraviolet and infrared as well.

Components of Light in Poultry Management
Artificial light can be described by distribution of light (photoperiod), colour (wave length)

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 55-59
© 2020 JEZS
Received: 07-01-2020
Accepted: 09-02-2020

DK Chaudhari
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Sachin Gautam
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

VK Singh
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Ruma Devi
Department of Livestock Products Technology, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

SP Singh
Department of Livestock Farm Complex, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Tewari
Department of Animal Nutrition, C.V. Sc & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Rao
C.R.C.U., Department of Animal Husbandry, Ayodhya Mandal, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sachin Gautam
Department of Animal Nutrition, C.V. Sc & A.H., A.N.D.U.A.T., Kumarganj, Ayodhya, Uttar Pradesh, India

Influence of herbal mixture, exogenous enzymes and butyric acid supplementation on nutrient digestibility, carcass characteristics and economics of broiler chickens

DK Chaudhari, Sachin Gautam, VK Singh, Ruma Devi, KD Singh, SP Singh, S Tewari and S Rao

Abstract
Three hundred commercial straight run, day old Ven Cobb 400Y chicks were divided into six groups with 5 replicates of 10 birds in each to assess the efficacy of herbal mixture, exogenous enzymes and butyric acid on their performance. The chicks were placed on basal diet with no supplement in negative control (NC) and basal diet supplemented with antibiotics, alcoholic extract of 0.5% herbal mixture, 0.5% herbal mixture (alcoholic extract) + 0.1% butyric acid, 0.5% herbal mixture (alcoholic extract) + 0.03% exogenous enzymes and combination of 0.5% herbal mixture (alcoholic extract) + 0.03% exogenous enzymes + 0.1% butyric acid in PC, HE, HEB, HEE and HEBE groups, respectively. The results of the analyzed data showed that DM and CP digestibility coefficient of herbal based non-antibiotic feed additive groups were similar to NC and PC group birds. Drawn weight yields were not affected by any additive supplements. The abdominal fat was significantly ($P<0.005$) lower in HEB and HE group birds as compare to NC and PC groups. Profit/bird live weight, benefit cost ratio and profitability of HEB group was significantly ($P<0.05$) better than NC, but ($P<0.05$) lower to PC group. It was concluded that, supplementation of alcoholic extract of 0.5% herbal mixture along with 0.1% butyric acid had no adverse effect on nutrient digestibility and carcass characteristics; however, profitability was higher than negative control birds.

Keywords: Herbal mixture, butyric acid, nutrient digestibility, carcass characteristics and economics

Introduction
Now a days poultry sector is one of the most popular and fastest growing livestock sector in India, contributing 10% of livestock and 0.7% of total GDP. The demand for low cost and processed quality chicken meat is growing by 15-20% annually. The aim of poultry production is to get proper growth rate, better feed conversion efficiency and maintaining optimal health to maximize production in terms of meat and egg. In poultry diet, antibiotic growth promoters (AGPs) are used for the protection against some diseases, toxins, improvement in nutrients absorption in intestines etc. However, the efficacy of antibiotics reduced due to development of resistance in pathogenic bacteria; besides this residues of antibiotics in meat have negative impact on public health. In most of the countries AGPs has been either regulated or banned (Lesson *et al.*, 2015) [14]. So, there is need of finding alternatives to growth-promoting antimicrobials without affecting their production. Several substances like essential oil of herbs, organic acids, probiotics, prebiotics, exogenous enzymes etc. have been investigated in recent years, which are able to support productive performance and prevent the incidence of some diseases in poultry (Huyghebaert *et al.*, 2011) [10].

Phytogenic feed additives are plant derivatives of plant extraxts, herbs and spices with extended activities viz., endogenous secretions in the gut, stimulation of feed intake and better growth. Herbs like aloe vera (*Aloe barbadensis*), ashwagandha (*Withaniasomnifera*), mangrail (*Nigella sativa*), turmeric (*Curcuma longa*), methi/fenugreek (*Trigonellafoenum-gracium*), neem (*Azadiractaindica*), punarnava (*Bhoeraviadiffusa*), tulsi (Ocimum sanctum), bhuiamla (*Phyllanthus emblica*) and garlic (*Allium sativa*) are commonly used as medicinal herbs in India and have antibacterial, antifungal, anti-inflammatory, antioxidant, growth promoting, hepatoprotective and immuno-stimulatory activities. Non starch polysaccharides (NSP) present in corn and soybeans are poorly digested by monogastric animals; represent a potential source

Global Veterinaria 22 (5): 267-272 2020
ISSN 1992-6197
© IDOSI Publications, 2020
DOI: 10.5829/idosi.gv.2020.267.272

The Saga of Macrominerals and its Role in Reproduction in Domestic Animals: A Review

[1]Rajesh Kumar, [2]R.P. Diwakar, [3]H.C. Verma, [4]Anand Kumar,
[5]Pramod Kumar, [6]K.D. Singh and [2]Vibha Yadav

[1]Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and
Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India
[2]Department of Veterinary Microbiology, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[3]Department of Veterinary & Animal Husbandry Extension Education,
C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[4]Department of Veterinary Gynaecology & Obstetrics,
Ranchi Veterinary College, B.A.U., Kanke, Ranchi-06, Jharkhand, India
[5]Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[6]Department of ILFC, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India

Abstract: A number of inorganic elements are essential for the growth, production and reproduction of animals. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Key words: Domestic Animals · Macrominerals · Production · Reproduction

INTRODUCTION

A number of inorganic elements are essential for the growth, production and reproduction of animals [1]. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. The inorganic elements are classified according to their requirements in animal body. Those required in greater quantities are referred as macrominerals (calcium. phosphorus, sodium, chloride, potassium, magnesium and sulfur). Macrominerals required in large amount each day and their concentration in diet is expressed as percentage of diet or in grams per kilogram of diet. Macrominerals has role in different physiological functions. Other elements required in much smaller amounts are referred as trace minerals (microminerals) i.e. copper, cobalt, iodine, iron, manganese, molybdenum, selenium, zinc, chromium and fluorine. Their concentration in diet is expressed as parts per million (ppm), which is equivalent to milligram per kilogram of diet or in some cases as parts per billion (ppb), which is equivalent to microgram per kilogram of diet. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Role of Various Macro Minerals in Animal Reproduction

Calcium (Ca): Calcium is an essential component of skeleton and plays a pivotal role in maintaining homeostasis of vertebrates [2]. The maximum portion of calcium present in the bone as hydroxyapatite (99%) and small fractions present in the cell membrane or endoplasmic reticulum (0.9%), extracellular fluid or serum (0.1%) and in cytosol (0.00002%) [3]. Extracellular calcium exist in three forms i.e. ionized (50%), complexes to anions (5%) such as citrate, bicarbonate, phosphate, or lactate and protein bound (45%). Ionized calcium involved in array of physiological processes such as muscular

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India.

The Pharma Innovation Journal 2020; SP-9(4): 23-25

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; SP-9(4): 23-25
© 2020 TPI
www.thepharmajournal.com
Received: 15-02-2020
Accepted: 17-03-2020

B Singh
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Professor, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Assistant Professor, Department of Livestock Farm Complex C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

N Singh
M.V.Sc. Scholar, Department of Veterinary Gynaecology and Obstetrics, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Gupta
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

P Gautam
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

G Pandey
Ph. D. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya- 224229, Uttar Pradesh, India

Corresponding Author:
B Singh
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Pre-Lambing behaviour of Muzzafarnagri sheep

B Singh, PS Pramanik, KD Singh, N Singh, VN Gupta, P Gautam and G Pandey

Abstract
The peri-parturient behaviour of 10 Muzzafarnagri ewes were observed at Livestock Farm Complex, A.N.D.U.A.T., Kumarganj, Ayodhya. All the ewes, in advance stages of pregnancy, that is one or two days prior to lambing, there were relaxation of pelvic ligament; the udder enlargement distended and tightened and waxy; vulva became oedematous and flabby, showing mucus discharge. The restlessness in ewes generally observed 152.25 ± 16.565 min before actual birth of lamb. Onset of intermittent abdominal straining in ewes started 76.66±8.223 min before actual birth of lamb and it was repeated at an interval of 10-12 min, during peak stage of labour. Intense and regular straining in ewes, started on an average 6.33±0.69 min, before actual birth of lambs. The appearance and rupture of chorio-allantoic sac occurred on an average 4.73±0.532 min, before actual birth of lamb. The average time taken by lamb to appear vulva was 3±0.362 min before actual birth of lamb.

Keywords: Muzzafarnagri ewes, pre-parturent behaviour, lambing presentation

Introduction
Sheep raising in India is one of the traditional occupation of some people popularly known as shepherds or Gadariya. People of some regions of our country are raising sheep as a domestic animal for fulfilling family nutrition demand and business purpose from the ancient time such as in Kashmir region sheep is reared for delicious mutton and for beautiful and warm woollen clothes, sheep reared in Uttarakhand and other Himalayan region used as food for scarcity season. Sheep is a small sized, ruminant, calm animal and grows fast and the raising system is very easy and simple. There are various sheep breeds are available in our country which are suitable to the particular region and climate. Now a day, many people are taking the opportunities of sheep farming as business to grow family income. Sheep with its multi-facet utility for wool, meat, milk, skins and manure, form an important component of the rural economy particularly in the arid, semi-arid and mountainous areas of the country. It provides a dependable source of income to the shepherds through the sale of wool and animals.
Sheep is an important species of farm livestock. There is a vast genetic diversity in sheep and out of about 200 breeds listed in the world, 43 breeds of sheep are found in India. The Indian subcontinent is a rich source of diverse ovine germplasm, and only very few countries have such a large number of breeds with wide genetic diversity. In India Sheep make a valuable contribution to the livelihood of the economically weaker sections of the society. Amongst the livestock owners, the shepherds are the poorest of the lot. The export earnings from different woollen products and mutton are also noticeably contributing to the National income. Sheep-skin in the form of leather and leather products is also exported.
The breed Muzzafarnagri is distributed in Muzzafarnagar, Bulandshaher, Saharanpur, Meerut and Dehradun districts of Uttar Pradesh, Uttarakhand and parts of Delhi and Haryana. The animals are medium to large in size. Face line is slightly convex. Ears and face are occasionally black. Both sexes are polled. Males occasionally show rudimentary horns. Ears are long and drooping. The tail is extremely long and reaches fetlock. The fleece is white, coarse and open. Belly and legs are devoid of wool. The overall least square means for lambs 1st and 2nd six monthly and adult annual clips were 582.17, 538.75 and 1217.62g, respectively under farm conditions. The overall averages were 3.63, 15.59, 23.52, 27.14 and 30.76kg, respectively at birth, 3, 6, 9 and 12 month age. Least square means of wool quality attributes viz. fibre diameter, hetro fibres, hairy fibres, medullation and staple length were 38.39±1.36µ, 14.35±1.37%, and 46.89±3.42%.
Knowledge of animal's natural behaviour is essential in ensuring to create an environment, manage and care for individual animals and flocks in a manner that enables them to express

The Pharma Innovation Journal 2020; SP-9(4): 18-22

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; SP-9(4): 18-22
© 2020 TPI
www.thepharmajournal.com
Received: 12-02-2020
Accepted: 14-03-2020

B Singh
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Professor, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Assistant Professor, Department of Livestock Farm Complex C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

J Singh
Associate Professor, Department of Animal genetics and Breeding C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Gupta
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

P Gautam
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

G Pandey
Ph. D. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya- 224229, Uttar Pradesh, India

Corresponding Author:
B Singh
M.V.Sc. Scholar, Department of Livestock Production & Management, C.V.Sc.&A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Post-Lambing behaviour of Muzzafarnagri Ewes and Lamb

B Singh, PS Pramanik, KD Singh, J Singh, VN Gupta, P Gautam and G Pandey

Abstract
The post-parturient behaviour of 10 Muzzafarnagri ewes were observed at Livestock Farm Complex, A.N.D.U.A.T., Kumarganj, Ayodhya. All the ewes, in most of the cases, the lamb appeared at vulva whilst the ewes were in recumbent position. In most of the lambing the presentation of foetus was anterior (about 75%). Post lambing behaviour of ewes seen important in establishing of mother-neonate bond to accept or reject of the lambs by ewes. Most of the ewes initiated licking immediately after parturition. The duration of licking and grooming behaviour up to 6 hr post lambing was 24.6±1.28 min., complete expulsion of placenta after birth of lamb was 113.3 ± 4.30 min. There was no case of any dystocia found in Muzzafarnagri ewes. During after birth process the maternal orientation of ewes toward lambs were anterior (70%) and posterior (30%). Maternal rejection was observed 10% in relation to ewes after lambing and 90% ewes accepted their lambs. Placentophagia was absent in Muzzafarnagri ewes. The average time taken in delivery of foetus from anterior to posterior or posterior to anterior was 2.25±0.26 min. The total duration of resting up to 6 hr post lambing was 114.6 ± 4.31 min. The lamb started attempt to stand 4.08 ± 0.34 min after birth. The lambs made 9.42 ± 0.45 numbers of attempts to stand after birth. The average time taken by lambs to first stand was 25.75 ± 0.51 min after birth. Most of the lamb (75%) showed preferences of left teat for their first suckle and about 25% lamb preferred right teat for their first suckle.

Keywords: Post-parturient behaviour, lambing presentation, dystocia, placentophagia

Introduction
Indian climate is very suitable for setting up sheep farming as business or a livelihood in India. Sheep farming requires little investment of land and money, able to get the returns of investment within a very short period. Sheep farming in India can be a great source of good income for the marginal and landless farmers. Sheep is an important species of farm livestock. There is a vast genetic diversity in sheep and out of about 200 breeds listed in the world, 43 breeds of sheep are found in India. The Indian subcontinent is a rich source of diverse ovine germplasm, and only very few countries have such a large number of breeds with wide genetic diversity. Knowledge of animal's natural behaviour is essential in ensuring to create an environment, manage and care for individual animals and flocks in a manner that enables them to express themselves naturally and to remain healthy with a high quality of life. The behaviour of sheep is likely to be a complex interaction between their genetics and the fundamentally important early life experiences with their dam, further complicated by their association with their peers, particularly around weaning, and the quality and availability of grazing (Lawrence and Dwyer, 2000) [11].

Maternal Behaviour
Maternal behaviour is key to ensuring the survival of lambs, particularly when a ewe has two or more offspring. Newborn lambs need milk and immunological protection shortly after birth, and early interactions between the mother and the young are critical in this respect. Bonding, and consequently survival, of twins, can be considerably improved if the ewe remains at the birth site for a minimum of 6 hours, and this can be encouraged in part through feeding management. Two major factors contribute to the formation of this early bonding: postnatal vocal communication and sucking (Nowak, 1996) [14]. The ewe makes a low-level bleating noise, standing so as to encourage the lamb to find the udder and start suckling (Dwyer, 2014) [4]
The ewe and lamb maintain a close spatial relationship over the first week of life. After this period lambs gather into peer play groups and up to 4 weeks of age they go increasingly longer

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 88-92
© 2020 JEZS
Received: 10-01-2020
Accepted: 12-02-2020

VN Gupta
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

KD Singh
Department of Livestock Farm Complex, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

P Gautam
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

B Singh
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

G Pandey
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

D Nandan
Department of Livestock Production & Management, C.V. Sc. & A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
VN Gupta
Department of Livestock Production & Management, C.V. Sc. &A.H., ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of different litter materials on growth performance of broiler chickens

VN Gupta, PS Pramanik, KD Singh, S Gautam, P Gautam, B Singh, G Pandey and D Nandan

Abstract
Two hundred forty day old Vencobb 400 straight run commercial broiler chicks were randomly divided into three groups with two replicates of 40 chicks in each to assess the effect of different litter materials on growth performance of broiler chickens. The broiler chicks were kept on rice husk, 50 % rice husk + 50 % paddy straw and wood saving in Tc, T_{MIX} and Tws groups, respectively for a period of 42 days. The results of the experiment showed that broiler chicks kept under T_{mix} ($3027.20^{b}\pm80.50$g) i.e. combinations of paddy straw with rice hulls were heavier as compared to the other litter treatments. The overall body weight gain was numerically higher in T_{mix} as compared to the other litter treatments. It was also evident that feed intake was higher in T_c groups as compared to T_{MIX} and Tws groups. The overall FCR was superior in T_{mix} group ($1.84^{a}\pm0.21$) as compare to other group T_{ws} ($2.22^{ab}\pm0.15$) and T_c (2.42 ± 0.11). The results of the present experiment concluded that the growth performance indicated that final body weight, body weight gain, FCR were better in T_{mix} group than wood saving and the control group broiler birds however, feed intake was higher in T_c group.

Keywords: litter materials, paddy straw, rice hulls, broiler chicken

Introduction
The Poultry industry has emerged as the fastest growing segment of the livestock sector both globally as well as in India (Iisa Augustine and Ruchira Shukla, 2015) [7]. Now a days poultry meat is available for huge groups of consumers due to revolutionary mechanization of the poultry sector in recent years. The higher nutritional, sensory and economical characteristics of poultry meat have made it, far most famous animal food product globally. It has a high potential to generate foreign exchange earnings through export of poultry products to neighboring countries (Iisa Augustine and Ruchira Shukla, 2015) [7]. Broiler production is one of the most dynamic and fastest growing animal husbandry sub-sectors in India. The total poultry population has increased by 16.81% over in the recent census and the total poultry in the country is 851.81 million. However, in previous census 2012 it was 729.21 million in numbers (Livestock census, 2019) [12]. Due to increasing population growth, rising income and urbanization there is an increasing demand of animal protein source so that chicken meat has shown its fastest growth in last two decades.

The type of bedding can affect performance of broiler birds (Billgilli *et al.*, 1999b) [2]. The litter type affects litter bacteria and litter consumption which may influence the immunity and performance of broilers (Lien *et al.*, 1992) [10]. Common bedding materials include rice husk, paddy straw, wood shavings, sawdust, peanut hulls, shredded sugar cane, straw, and other dry, absorbent, low-cost organic materials. Sand is also occasionally used as bedding. The efficiency of litter type can be influence by various factors such as physical properties of the material used, particle size, build up moisture content and rate of caking. In many areas sawdust and wood shavings are most commonly used bedding materials for commercial poultry production. The higher cost, poor supplies and unavailability of these litter materials has encouraged the search for suitable substitute litter materials. Good bedding materials should absorb the moisture from body wastes, limiting the production of harmful pathogenic micro-organisms and ammonia, provide a dry, comfortable medium to broilers for dusting themselves in and rest upon. Therefore, it should be soft, compressible, absorbent and capable of drying quickly.

In this context the use of crop and wood residues as poultry litter seems to be promising. Hence, the present experiment was designed to assess the effect of different litter materials on

Indian Journal of Poultry Science (2019) 54(2): 151–154; Research Article
DOI: 10.5958/0974-8180.2019.00032.1

Effect of litter treatment on growth, carcass traits and immunity status of broiler chickens

R.K. CHAKRAVATI, P.S. PRAMANIK, K.D. SINGH, M.K. SINGH*[1] AND J. MANOJ

Department of Livestock Production Management
College of Veterinary Science and Animal Husbandry, NDUAT, Faizabad, U.P.
[1]Department of Livestock Production Management
College of Veterinary and Animal Sciences, SVPUAT, Meerut (UP)

(Received on December 31, 2018; accepted for publication on June 03, 2019)

ABSTRACT

Chakravati, R.K., Pramanik, P.S., Singh, K.D., Singh, M.K. and Manoj, J. 2019. Effect of litter treatment on growth, carcass traits and immunity status of broiler chickens. Indian Journal of Poultry Science, 54(2): 151-154.

The aim of the present study was to evaluate the effect of various strengths of alum as litter amendment on broiler performance, carcass traits, litter quality and immunity status of broiler birds. About 200 day old Vencobb chicks were divided in to four equal groups, having 50 chicks in each group. The groups T_1, T_2 and T_3 were reared on litter material which is treated with various alum concentrations and the control group without any litter amendment. The present study revealed that the broiler litter group which is amended with alum at a concentration of 0.095 kg/bird,enhanced theoverall body weight gain of broilers with superior carcass traits. The immune level of the broilers were also found better as evidenced from reduced heterophils lymphocytes ratio of litter treated groups. Therefore, it is concluded that alum at a concentration of 0.095 kg/bird can be safely used for broiler litter treatment without any detrimental effects on environment.

Key words: Alum, Broiler, Carcass, Immunity, Growth performance, Litter

INTRODUCTION

Poultry is one of the rapidly growing segments of the agricultural sector in India with an annual growth rate of 6 to 8 percent in broiler meat and 5 to 7 percent in egg production today. Their growth rate has been rising at 8 to 10 percent per annum (Bhanja, 2019). As a result, India is now the world's third largest egg producer and the fifth largest producer of broilers.Rearing of birds in deep litter system of housing is common practice in India for broiler production. The poultry litter quality and status influence bird's performance and also influences economic status of producers and integrators (de Oliveira*et al.*, 2015). The poultry litter used for broiler rearing is a source of released ammonia and its amlioration is an important factor which influences the performance and health status of birds (Rashid *et al.*, 2017). Keeping litter in a dry condition is a critical part of management of poultry farmssince the wet litter causes increased release of ammonia, which negatively affects the productive performance of broilers (Ritz *et al.*, 2006; Nagaraj *et al.*, 2007; Sahoo *et al.*, 2017). Kristensen *et al.* (2000) observed that the intake of feed and overall body weight gain of broilers was decreased when ammonia concentrationwas increased in poultry sheds. The ammonia emission can also affect the atmospheric gaseous balance and biodiversity (Rashid *et al.*, 2017).

Dry litter helps to control the ammonia level, providing the healthy flock environment and reduces condemnations due to various leg ailments and breast blisters (de Oliveira *et al.*, 2015). Dry litter is also important for health and wel being of labourers working at poultry farms (Kristensen and Wathes 2000; Miles *et al.*, 2004; Sahoo *et al.*, 2015). Different chemical compounds are being studied by numerous scientists for making litter dry. The application of alum ($Al_2(SO_4)_3.14H_2O$) as poultry litter amendment for decreasing the release of ammonia from poultry litter in sheds is an economical method (Gilmour *et al.*, 2004; Choi and Moore, 2008).Rashid *et al.* (2017) suggested that application of acidic litter amendments should be encouraged for beneficial broiler production. The alum also lowers water soluble phosphorous and therefore the alum treated litter had beneficial effects on field application as fertilizer (Moore *et al.*, 2000; Sahoo *et al.*, 2015). The present studywas plannedto compare the effect of different concentrations of alum as litter quality improvement on broiler performance, carcass traits, litter quality and immunity status of broiler chickens.

*Corresponding Author Email: drmanoj611@gmail.com

MATERIALSAND METHODS

The experiment was carried out at the poultry unit of Instructional Livestock Farm Complex of the College of Veterinary and Animal Husbandry, NDUAT, Kumarganj, Faizabad, Uttar Pradesh after getting the approval of Institutional Animal Ethical Committee. A total number of 200 day old of Vencobb strain chicks were procured from a commercial hatchery and they are divided in to four groups, *viz.* control (C) group, T_1, T_2, and T_3 having 50 chicks in each group.All the chicks were fed according to two phase feeding program, with a starter feed from 1 to 28 days and finisher feed from 29 to 42

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 174-181

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 174-181
Journal homepage: http://www.ijcmas.com

Original Research Article

Study on Man-Power Utilization Pattern of Milking Operations in Dairy Animals

Archana Sachan[1*], P. S. Pramanik[1], K. D. Singh[2], A. K. Verma[2] and M. K. Verma[3]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[2]Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[3]Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
**Corresponding author*

Keywords
Man-power utilization, milking operation, hand milking, dairy animals

A B S T R A C T

The aim of the present investigation was to examine the man-power utilization pattern of milking operation in dairy animals. The present study was conducted on 23 selected milch animals at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, U.P. The loose housing system was followed in the farm and animals were maintained within the enclosure having covered area on and around the feed manger. Hand methods of milking were performed in separate milking byre in two shifts following single row system. Man-min required under hand milking operations were recorded by a stop watch and observations were taken for 30 days. The results showed that, that time required in unit operation (sec/ Litre milk) decreased with increase in milk yield of animals. Man-second utilized for unit operation of 0-2, 2-4 and 4-6 litre milk yield group was 166.94, 90.59, and 75.80 second respectively. The average total milking time required for milk yield groups of 0-2, 2-4, and 4-6 litre was 268.77±11.10, 307.09±9.23 and 390.4±10.95 second respectively. These groups had an average yield of 1.61, 3.39 and 5.15 litre milk respectively. Similarly, for evening milking, milk yield group studied were 0-2, 2-4 and 4-6 litre which has an average production of 1.52, 3.25 and 5.08 litre milk respectively. The time required for the milking of per litre of milk for these groups was 188.76, 94.21 and 65.51 second respectively. It was observed with increase in milk yield the time required in unit operation was observed to be in decreasing order. The total time required in milking operation increased from 286.92±9.73, 306.17±12.13 and 332.8±11.84 second respectively. From the present study it may be concluded that total average time spent in hand milking operation of animals was found maximum in morning milking followed by evening milking.

Introduction

The dairy farming is a two-stage production system, i.e., cultivation of fodder crops and management of milch animals, currently contributes about 132.4 million tones (Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GOI) of milk and acts as a substrate to channelize energies of 143 million men and 35 million women farm workers to participate in the production process in India (Patel and Mehla, 1988). Man-power is the most critical resources

VOL. VIII, ISSUE SPECIAL(C) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[2], Vishuddha Nand[2] and A.K. Srivastav[2]
[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N/L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tremadol (T_T) and lignocaine+tremadol (T_{L-T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because hornless cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Goonewardene and Hand, 1991; Faulkner and Weary, 2000: Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with researched methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978). The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Bengtsson *et al.* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al.* 1999). The Council of Europe recommends the use of anesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L-T}). Medication was done 5-10 minutes before disbudding. Two doses of ligocaine per bud were injected for cornual nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (^{0}F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY ON THE BEHAVIOURAL RESPONSE PRE AND POST DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[3], R.P. Diwaker[1], Rajesh Kumar[4] and Gaurav Panday[1]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

[3]Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the behavioural response pre and post disbudding in calves. The study was carried out at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females. Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L), Tramadol @ 0.25 mg/ kg body weight I/M (T_T) and Lignocaine (2%) @ 1 ml/ bud + Tramadol @ 0.25 mg/ kg body weight I/M. After medication calves were disbudded by hot iron method. The behavioural parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The results showed that, at 24h, $T_{L\text{-}T}$ group showed significantly lowest (0.00±0.00/min) which was statistically similar with T_0, T_L and T_T groups. Sleeping activity was significantly different only at 6h among different treatment groups. At 0h and 24h standing were significantly different among treatment groups. At 0h, 1h, 6h and 24h walking was significantly different among treatment groups. There was no significant difference in feeding, whereas at 1h and 24h drinking was significantly different among groups. At 1h and 6h urination was significantly different among groups. At 1h and 6h, T_0 group showed significantly highest head rubbing with hind foot activity (1.83±0.30/min and 1.16±0.16/min, respectively) which was significantly different from T_L, T_T and $T_{L\text{-}T}$. At 1h, 6h and 24h head rubbing with inanimate object was significantly different among groups. At 1h and 6h head shaking was significantly different among groups. At 1h, T_0 group showed significantly highest (1.83±0.30/min) which was significantly difference from T_L, T_T and $T_{L\text{-}T}$ groups. There was no significant different in biting among different treatment groups, whereas at 6h, T_0 group showed significantly highest (0.66±0.21) which was significantly different from T_L, T_T and $T_{L\text{-}T}$ groups. In this study vocalization, sitting activity were significantly higher in control than treated groups. No significant differences were observed in feeding and biting activities during the whole period of the study. In present study it may be concluded that the calves of T_T group shows comparatively better performance in pain alleviation behavioural activities.

Introduction

Disbudding is a painful yet important routine husbandry procedure in the global dairy and beef industries. Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage, to minimize trough space requirements, and to meet transport requirements (Prayaga, 2007). Removal of the horn before its attachment to the skull (disbudding) tends to create a more superficial and less traumatic wound, likely resulting in less pain and bleeding and a shorter healing time (Petherick, 2011). Topical anaesthesia may be a practical and more affordable option for pain alleviation. Administered postoperatively, local anaesthetic agents are fast-acting and highly effective when applied to open wounds or mucosal tissues (Lomax *et al.*, 2008). The preoperative injection of local anaesthetics (cornual block; Weaver *et al.*, 2005) has been found to be effective in reducing pain (cortisol concentrations) for up to 2 h (lignocaine) and 4 h (bupivacaine) following dehorning (McMeekan *et al.*, 1998a). Changes in animal behavior, including increased frequency of head shaking, ear flicking, tail flicking, and reduced rumination, is also suggestive of a painful experience that persists for up to 6 h following dehorning (Sylvester *et al.*, 2004). The Council of Europe recommends the use of anesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy Cattle* (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge.

Materials and Methods

The study was carried out at Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L), Tramadol @ 0.25 mg/ kg body weight I/M (T_T) and Lignocaine (2%) @ 1 ml/ bud + Tramadol @ 0.25 mg/ kg body weight I/M. Medication was done 5-10 minutes before disbudding. Two doses of ligocaine per bud were injected for cornual nerve block in calves.

After medication calves were disbudded by hot iron method. Hairs around each horn bud were clipped and Vaseline was applied around each bud to protect damage or burning of surrounding tissues. The disbudding is considered sufficient when the corium of the horn is completely cauterized and rough surface is encountered, then relation of red hot iron is stopped. After disbudding, antiseptic Soframycin skin cream® and Topicure Herbal spray® as fly repellent were applied on each bud till complete healing of wound.

Table 1: Description of behaviours recorded during and after disbudding in calves

S.No.	Behavior	Description/ definition
1	Sitting	Lying on group with open eye
2	Sleeping	Lying on ground with closed eye
3	Standing	Erect on all four legs
4	Walking	Movement of all four legs at least once
5	Feeding	Head in feeder whether taking feed or not

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 168-173

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 168-173
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Disbudding on Haematological Parameters in Calves

Shiv Swaroop[1], P. S. Pramanik[1], K. D. Singh[2*], A. K. Gangwar[3] and P. K. Chaudhary[4]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[2]Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[3]Department of Veterinary Surgery and Radiology, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[4]Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
**Corresponding author*

ABSTRACT

The aim of the present investigation was to examine the effect on haematological profile before and after disbudding in calves. The study was carried out at the Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study haematological parameters (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N/L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tremadol (T_T) and lignocaine + tremadol (T_{L-T}). After medication calves were disbudded by hot iron method. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. Haematological responses recorded before and after disbudding. The results showed that, at 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in T_T group which was statistically similar with T_{L-T} group but significantly differed with T_L and T_T groups at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. It may be concluded that no significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance.

Keywords

Disbudding, Hematology, lignocaine, tremadol, N/L ratio, calves

VOL. VIII, ISSUE SPECIAL(E) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF STOCKING DENSITY ON STRESS REACTION AND FOOT PAD LESIONS IN BROILER CHICKEN

K.D. Singh[1*], P.S. Pramanik[2], Rajesh Kumar[3], R. P. Diwakar[4] And Gaurav Pandey[2]

[1]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad-224229, Uttar Pradesh, India

[2]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

[3]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

[4]Department of Veterinary Microbiology, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad-224229, Uttar Pradesh, India *Corresponding author*

Abstract

The research was conducted to investigate the effect of stocking density (i.e., I.C.A.R., Venkys and Amrit recommendations) on stress reaction & foot pad lesions in broiler chicken. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches. Each batch was subdivided in 3 equal groups (i.e., I.C.A.R., Venky's and Amrit). All the birds were raised on pucca floor with saw dust as litter material providing equal managemental practices. The blood samples were collected at 4th, 5th and 6th week of the study. H: L ratios were calculated by dividing the number of heterophils by the number of lymphocytes counted. Daily observations for foot pad lesions of birds were recorded. Twenty birds from each group were scored for foot pad lesions (FPL). The results showed that, number of lymphocytes decrease and the number of heterophyl increase in response to stressors. The heterophyl and lymphocyte count (%) was significant (P<0.01) in all the weeks under study. Higher HET count (%) was observed under Amrit followed by Venky's and I.C.A.R. floor space recommendation during last three weeks. The almost similar but reverse pattern of LYM count (%) have been observed like HET count (%) of broiler chickens under three stocking densities at week 4, 5 and 6. At week 4, H: L ratio under I.C.A.R. (00.67±0.015) significantly (P<0.01) higher than that of both Venky's (00.52±0.009) and Amrit (00.52±0.005) recommendations which did not differ each other. At week 5 the H: L ratio in Amrit (00.66±0.012) recommendation was significantly (P<0.01) more than rest recommendations. At week 6 the highest and lowest H: L ratio was 0.71±0.008 (Amrit) and 0.50±0.005 (I.C.A.R.) respectively. There were significant (P<0.01) differences among all the three ratios. The FPL score 0 (no lesion) was significantly higher in I.C.A.R. followed by Amrit and Venky's at 2 & 3 week. At 4th week, L.S. means of FPL score 0 was significantly lower in I.C.A.R. than Venky's and Amrit. At 6 week, it was significantly higher in I.C.A.R. &Amrit than Venky's. The FPL score 1 (mild lesion) was significantly higher in Venky's followed by Amrit& I.C.A.R. at 2 and 3 week. At 4th week, it was higher in I.C.A.R. than other two groups. However, at 6 week, it was significantly higher in Venky's than I.C.A.R. and Amrit. The FPL score 2 (severe lesion) was significantly higher in Venky's and Amrit than I.C.A.R. at week 2. At week 4, it was statistically higher in I.C.A.R. than other two groups. This can be concluded that H: L ratio was higher under Amrit's recommendation than those in Venky's and I.C.A.R., whereas higher the stocking density higher the incidence of foot pad lesions in broiler chickens.

Keywords: *stress reaction, foot pad lesions, stocking density, hyperkeratosis, H: L ratio, H & L count.*

Introduction

The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012). Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.57 percent and 11.44 percent in egg and broiler production, respectively. The value of output from the poultry sector was US$10 billion in 2014 (Rajendran *et al.*, 2014). Broiler production has been more vibrant than layer production within the poultry sector, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (Index Mundi, 2015). India is the fourth largest producer of poultry meat in the world, valued at US$ 6.6 billion. Poultry production accounts for about 0.66 percent of India's GDP and 7.72 percent GDP from the livestock sector (Rajendran *et al.*, 2014). Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014. The per capita availability of poultry meat is 2.8 kg; against recommended level of 11 kg (Rajendran *et al.* 2014; Index Mundi, 2015). The main reasons for improved broiler poultry production (Kalamkar, 2012; SAPPLPP, 2009) are: modernization of production practices; import of pure lines/grandparent stock; least-cost feed formulation; vaccines against major diseases; provision of EAS and other input services; improved quality breeder management; developments in poultry processing; and private sector partnerships through Contract Broiler Farming. It is estimated that 37 percent of broiler production in India is under contracts, and about 78 percent of those contracts are concentrated in southern India (Rajiajwani, 2012). The term "stress" is commonly used to describe the detrimental effects of a variety of situations on the health and performance of poultry (Moberg, 2000). Birds have limited body resources for growth, reproduction, response to environmental changes, and defense mechanisms. The adaptation process due to stress causes the release of hormones and requires the redistribution of body reserves including energy and protein at the cost of decreased growth, reproduction, and health (Estevez, 2007). After extended or repeated periods of stress, birds become fatigued and weak; they often succumb to starvation and infectious diseases (Heckert *et al.*, 2002; Estevez, 2007). In several studies, it has been determined that psychological and physical stressors such as fasting, frustration, water deprivation and crowding, increase the ratio of Heterophil to Lymphocyte (H/L) (Dozier *et al.*, 2006; Buijs *et al.*, 2009). The H/L ratio has been shown to be highly heritable (al-Murrani, *et al.*, 1997) and a reliable index for determining stress in poultry (Heckert *et al.*, 2002). Stocking density in general is a significant factor in broiler performance (Feddes *et al.*, 2002; Heckert *et al.*, 2002; Tablante *et al.*, 2003). Recently, chicken paw prices have escalated due to an insatiable demand for high-quality paws in export markets. This demand has turned paws into the third most important economic part of the chicken behind the breast and wings, with paws accounting for approximately $280 million a year (US Poultry & Egg Export Council, 2009). The lesions that are caused by FPD are a concern to the poultry industry as a cause of animal welfare, food safety, and product downgrade issues. Animal welfare audits in Europe often use foot, hock, and breast burns-lesions as an indicator of housing conditions and the general welfare of the birds (Haslam *et al.*, 2007). In fact, the occurrence of FPD is now used as an audit criterion in welfare assessments of poultry production systems in Europe and the United States (National Chicken Council, 2010). Foot-pad lesion is an important aspect of bird welfare. In severe cases, the foot-pad lesions may cause pain which together with a deteriorated state of health constitutes a welfare issue. Harms and Simpson (1975) reported that birds with foot-pad dermatitis had an unsteady walk, and Hester (1994) described how foot-pad dermatitis causes birds to walk with a hobbling gait.

Materials and Methods

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 182-189

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 182-189
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Stocking Density on Stress Reaction and Mortality in Broiler Chickens

K. D. Singh[1*], P. S. Pramanik[2] and Rajesh Kumar[3]

[1]Department of ILFC, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[2]Department of LPM, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[3]Department of VGO, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
**Corresponding author*

Keywords

Stocking density, stress reaction, mortality, broiler chicken

A B S T R A C T

The research was conducted to investigate the effect of stocking density (I.C.A.R., Venky's and Amrit recommendations) on stress reaction and mortality in broiler chicken. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches, each containing 3 equal groups (i.e., I.C.A.R., Venky's and Amrit). The blood samples were collected at 4th, 5th, and 6th week of study and mortality were recorded every day. After May-Grunwald–Giemsa staining, H: L ratios were calculated. The results showed that, LYM and HET numbers decrease and increase respectively in response to stressors. The HET and LYM count (%) was significant ($P<0.01$) in all the weeks of study. At week 4, H: L ratio under I.C.A.R. (00.67+0.015) significantly ($P<0.01$) higher than that of both Venky's (00.52+0.009) and Amrit (00.52+0.005) recommendations which did not differ each other. At week 5 the H: L ratio in Amrit (00.66+0.012) recommendation was significantly ($P<0.01$) more than rest recommendations which, however did not differ each other. At week 6 the highest and lowest H: L ratio were 0.71+0.008 (Amrit) and 0.50+0.005 (I.C.A.R.) respectively. All the three ratios differ significantly ($P<0.01$). This can be concluded that H: L ratio was higher under Amrit's recommendation than those in Venky's and I.C.A.R. No significant difference was observed among mortality rates of broiler chickens under these three stocking densities during all the weeks studied.

Introduction

Archaeological discoveries in the Indus Valley suggest that chickens were probably domesticated from the red jungle fowl (*Gallus gallus*) as early as 5400 B.C. (West and Zhou, 1988). The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012). Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.57 percent and 11.44 percent in egg and broiler production, respectively. The sector is providing direct or indirect employment to 6.5 million people. About 80 percent of the employment is generated directly by poultry farms; the rest by the feed, pharmaceutical, equipment and other support services required by poultry. The value of output from the poultry sector was US$10 billion in 2014

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4380-4386

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 4380-4386**
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Ascorbic Acid on Storage Capacity of Murrah Bull Epididymal Spermatozoa at Refrigerator Temperature

Hridesh Kumar[1*], Sushant Srivastava[1], Rajesh Kumar[1*], Rabindra Kumar[1] and K. D. Singh[2]

[1]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
[2]Department of Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India
**Corresponding author*

ABSTRACT

The present investigation was carried out at Deep Frozen Semen Laboratory, Department of Veterinary Gynaecology and Obstetrics, C.V.Sc.&A.H., N.D.U.A.&.T., Kumarganj, Faizabad (U.P.) with the aim to examine the effect of ascorbic acid on epididymal spermatozoa of Murrah bull on freezability. A total 56 pair (8 pair of testicle in each groups) of testicle were utilize and semen was collected at 6hrs (G1), 12hrs (G2), 24hrs (G3), 36hrs (G4), 48hrs (G5), 72hrs (G6) and 96hrs (G7) after slaughter. All testicles were stored at refrigerated temperature (4^0C) till semen collection. Basic extender used in this research was Tris-buffer and ascorbic acid. Semen dilution & addition of ascorbic acid to maintain addition of concentration in the dilution in the group T1, T2 & T3 @ 1mM, 2mM & 3Mm respectively along with a control group. Post thawed evaluation of refrigerated semen done after 24 hrs storage at the parameters like % progressive motility, %of live count, % of sperm abnormality and % HOS reactive spermatozoa test. The results showed that, mean (±SE) of percent post thaw motility in Epididymal semen collected indicates a significant ($P<0.05$) improvement in sperm motility was reported in T2 and T3 in all the groups (6, 12, 24, 36, 48, 72 & 96 hrs after slaughter). The mean (±SE) of percent live count in post thaw Epididymal semen collected 6, 12, 24, 36, 48, 72 & 96 hrs after slaughter have a significant ($P<0.05$) improvement in sperm livability in T2 and T3. The results showed that, mean (±SE) of percent post thaw sperm abnormalities in Epididymal semen collected indicates a significant ($P<0.05$) improvement in sperm abnormalities reported in T2 and T3 in all the groups (6, 12, 24, 36, 48, 72 & 96 hrs after slaughter). The mean (±SE) of percent Hypo osmotic swelling test in post thaw Epididymal semen collected after 6, 12, 24, 36, 48, 72 & 96 hrs after slaughter shows a significant ($P<0.05$) improvement in Hyper osmotic swelling test in T2 and T3. It may be concluded that the 6hrs and 12hrs collection of Epididymal semen of Murrah bull critically evaluated from storage point of view and ascorbic acid (@ 2mM) in semen additive appears to provide promising results.

Keywords

Ascorbic Acid, Spermatozoa, Epididymal, Refrigerated Temperature, Murrah Bull

Introduction

Buffaloes are integral part of Indian livestock sector followed by other ruminant species. India possesses 199.1 million cattle and 105.3 million buffaloes and ranks first

VOL. XII, ISSUE XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

EVALUATION OF DAIRY AND CARCASS PERFORMANCES OF LESSER KNOWN GANG-FATEHPURI SHEEP OF UTTAR PRADESH

M. K. Verma*[1], V.K. Singh[1], J. Singh[1], A. K. Verma[2] and Rajesh Kumar[3]
[1]Department of Animal Genetics & Breeding, [2]Department of Livestock Farm Complex, [1]Department of Veterinary Gynaccology & Obstretics, College of Veterinary Science and Animal Husbandry, AcharyaNarendra DevaUniversity of Agriculture &Technology, Kumarganj, Ayodhya U.P.
manojvet550@gmail.com

(MS Received: 07.08.2021; MS Revised: 13.09.2021; MS Accepted: 14.09.2021)

MS 2747 **(RESEARCH PAPER IN ANIMAL GENETICS & BREEDING)**

Abstract

The present investigation was carried out to evaluate the dairy and carcass parameters of lesser known Gang-Fatehpuri sheep in its breeding tract for a part of their recognition and registration as a new sheep breed. A total of 100 lactating ewes for dairy traits and 92 lambs of either sex were surveyed and evaluated. The overall means of daily milk yield, lactation length, fat contents and solid-not-fat contents were 260.25±5.14 g, 113.15±1.43 days, 8.04±0.22 % and 10.73±0.15 %, respectively. The effect of ewe's parity was significant ($p<0.05$) on daily milk yield. The overall averages of age at slaughter, pre slaughter weight, carcass weight and dressing percentage were 208.24±5.74 days, 24.51±0.59 kg, 11.09±0.31 kg and 45.18±0.29 %, respectively. The gender of lambs affected significantly ($p<0.05$) on all the carcass traits except age of slaughter.

Keywords: *Gang-Fatehpuri, dairy traits and carcass traits. (words in alphabetical order)*

Introduction

Indian ovine gene pool is quite diverse with 74.26 million populations. Sheep husbandry strengthen the rural economy of north-western arid habitats because of uncertainty of agricultural crop production due to less rainfall, limitation of irrigation facilities and low productivity of soil. In spite of two recognized sheep breeds in Uttar Pradesh, several unrecognized lesser known sheep genetic groups distributed in different geographic locations. The lesser known sheep are an important asset because they have best responds to their agro-climatic conditions. The Gang-Fatehpuri sheep distributed in Fatehpur, Kaushambi and Raebareli districts of Uttar Pradesh and contributed a significant proportion in livelihood of Pal/Gadariya communities of Uttar Pradesh.

The dairy and carcass performances are important economic aspects of sheep husbandry. The carcass parameters are directly correlated with growth parameters, which in turns affected by various genetic and non-genetic factors. Indeed, the dairy and carcass performances are important determinants, which directly shape the trading value of a sheep. The knowledge about the various performances of a genetic group is important necessities for their recognitions in animal genetic resources. Keeping these views, the present study was aimed to quantify the dairy and carcass characteristics of Gang-Fatehpuri sheep.

Materials and Methods

The total of 100 ewes for dairy parameters and 92 lambs of either of the sex for carcass traits were taken in the present study. The work was approved by Institutional Animal Ethics Committee (IAEC) for animal experiment of Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh wide reference no. IAEC/CVSc/2/P-37/2020/31. The dairy parameters *viz.* daily milk yield, (DMY), lactation length, (LL), milk fat % (Fat %), solid-not-fat % (SNF %) and carcass traits namely age at slaughter, (AS), pre slaughter weight (PSW), carcass weight (CW) and dressing percentage (DP) were studied. The data regarding traits under study were collected by face to face interview method using pre tested questionnaire from farmer's flocks in Fatehpur district. The 40 randomly selected milk samples were tested for their quality parameters at by auto milk analyzer at the Namaste Co-operative dairy milk collecting centre. The data of dairy parameters were divided into two season of lambing (1st: Jan.-Jun.; and 2nd: Jul.-Dec.) and three parity (1st, 2nd and 3rd). The animals were slaughtered after 24 hour fasting at Aldua food processing unit, Aligarh, Uttar Pradesh. The data of carcass traits were divided according to sex. All the data of dairy and carcass traits were analyzed by SPSS 20 software programme.

Results and Discussions

Dairy performances

The dairy performances under study were presented in table 1. The present results of daily milk yield of Gang-Fatehpuri ewes were more or less consistent with Muzaffarnagari and Jalauni sheep (Acharya *et al.*, 1982). Conversely, the lower daily milk yield was reported in Jaisalmeri sheep (Arora *et al.*, 2007). Moreover, the higher daily milk yield observed in Malpura (Karim *et al.*, 2001; Mishra, *et al.*, 2009; Saha *et al.*, 2009), Malpura x Awassi halfbreds (Narula *et al.*, 1999), Pattanwadi (Saha *et al.*, 2009; Mohapatra, *et al.*, 2020).

The present finding of lactation length was in close agreement with the observations in and Jalauni (Acharya *et al.*, 1982) and Awassi sheep (Jawasreh *et al.*, 2019). Unlike to present finding, lower lactation length were observed in Awaasi sheep (Haile *et al.*, 2019), and higher lactation length was observed in Madgyal sheep (Tekede *et al.*, 2020).

As comparable to present finding, the lower fat % observed in Awassi (Jwasreh *et al.*, 2019), Lacune (Giambra *et al.*, 2004), Cres x Awassi crossbreds, however, BoroMiac *et al.*, 2009 reported higher fat% in Cres sheep.

Like to present observation, similar SNF % was reported by BoroMiac *et al.* (2009) in Cres and Cres x Awassi genotypes. Conversely, the lower SNF% were observed in Malpura and Awassi sheep by Karim *et al.* (2001) and Jawasreh *et al.*, (2019), respectively. Furthermore, Gimbra *et al.*, (2004) reported higher SNF% in Lacune sheep.

The parity of ewes was significantly affected the daily milk yield of Gang-Fatehpuri ewes. Similar significant effects of ewe's parity on daily milk yield were mentioned by in Malpura and its crosses with Awassi sheep (Arora *et al.*, 2004; Sharma *et al.*, 2009).

(correct the red marks)

Carcass performances

The carcass characteristics under present study were depicted in table 2.

Our finding of age at slaughter was in agreement with the observations reported by Santoshkumar *et al.* (2018) in Mecheri lambs and Hussain *et al.* (2019) in Bannur, Kenguri and Yalaga lambs. Conversely, the lower age at slaughter was observed in Malpura (Singh *et al.*, 2003; Kumar *et al.*, 2008) and Madgyal lambs (Tekede *et al.*, 2020).

The present finding of PSW was compared well with observations in Muzaffarnagari (Kumar *et al.*, 2015) and Kenguri lambs (Hussain *et al.*, 2019). Unlike present findings, the lower estimates were reported in Malpura (Kumar *et al.*, 2008), Mandya (Kumar *et al.*, 2018) and Madgyal lambs (Tekede *et al.*, 2020). Moreover, the

SHORT COMMUNICATION

Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India

Manoj K. Verma[1]*, Vindhyavashini K. Singh[1], Jaswant Singh[1], Ajeet K. Verma[2]

Abstract

The present study was aimed to evaluate morphometric characteristics of lambs of less known native sheep of Gang-Fatehpuri of Fatehpur district of Uttar Pradesh during different growth stages in its breeding tract for breed recognition and registration with NBAGR, Karnal, India. A total of 365 lambs of either sex of different age groups (94, 102, 95, and 74 heads of 3, 6, 9, and 12 months of age, respectively) were surveyed in 15 villages of Fatehpur district. The overall values of body weight and body measurements, *viz.*, body length, height at withers, chest girth, tail length, and ear length recorded at 12 months of age (sexual maturity) were 29.62 ± 0.46 kg, 73.47 ± 0.46 cm, 73.54 ± 0.51 cm, 77.63 ± 0.43 cm, 40.08 ± 0.23 cm, and 18.29 ± 0.13 cm, respectively. The mean values of all the traits, except ear length, of male lambs, were significantly ($p < 0.05$) higher/larger than female lambs. The differences gradually increased significantly ($p < 0.01$) with advancing age from 3 months to 12 months. The values were generally comparable with the earlier known sheep breeds like Muzaffarnagari, and Kajali of the region.

Keywords: Body measurements, Body-weight, Gang-Fatehpuri, Mutton type breed.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.4.17

Introduction

India has vast biodiversity of ovine genetic resources with multipurpose utility for wool, mutton, milk, skin, and manure. The livestock population develops through unique adaption to their agro-climatic environments and their survival over a prolonged duration. Sheep rearing is a valuable component of the rural economy of India's arid, semi-arid and hilly areas. A systematic attempt to characterize and conserve animal breeds were started after establishing the National Bureau of Animal Genetic Resources (NBAGR) at Karnal, India. In addition to 44 well-recognized sheep breeds, many unrecognized, uncharacterized, and lesser-known sheep genetic populations are disseminated in the entire country. The biometric measurements of different body parts have a significant relationship with the body-weight of animals (Nayak *et al.*, 2008; Mishra *et al.*, 2016; Dass *et al.*, 2019).

The body measurements (body length, height at withers, chest girth) and body weight are used as an indicator of adult size, feeding requirements, and physiological maturity of animals. Furthermore, based on body measurements, an association can be established between body conformation and functionality of animals. Thus, body measurements can assist in the evaluation of growth performance as well as the meat production potential of Gang-Fatehpuri sheep. In view of the facts above, the present study aimed to evaluate the body weights and body morphometric measurements during the growth period of one year of this breed, as part of its recognition and registration with the Animal Genetics Bureau.

[1]Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India

[2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India.

Corresponding Author: Manoj K. Verma, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, India, e-mail: manojvet550@gmail.com

How to cite this article: Verma, M.K., Singh, V.K., Singh, J., Verma, A.K. (2021). Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India. Ind J Vet Sci and Biotech, 17(4), 80-82.

Source of support: Nil

Conflict of interest: None.

Submitted: 12/02/2021 **Accepted:** 11/07/2021 **Published:** 10/10/2021

Fig. 1: 12 months old Gang-Fatehpuri lamb

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

STUDIES ON REPRODUCTIVE TRAITS OF JAUNPURI GOATS

Pawan Kumar, V. K. Singh, Jaswant Singh*, N.S. Singh and M. K. Verma
Department of Animal Genetics and Breeding
College of Veterinary Science & A.H., N. D. University of Agri. & Tech.,
Kumarganj, Faizabad, U.P. (India)

Abstract

The present study was conducted to evaluate the various reproductive traits of the Jaunpuri female and male goats under the field condition during 2009-10. Data on 104 does and 34 bucks were collected for evaluation of female and male reproductive traits, respectively in its two native districts viz. Jaunpur and Sultanpur of eastern Uttar Pradesh.

Data on reproductive performance such as breeding methods, age at first estrus, age at first kidding, service period, number of service per conception, kidding interval and gestation length were recorded on 293 Jaunpuri goats of various age groups in its two native districts viz., Jaunpur and Sultanpur of Eastern U.P. during 2009-10. The average age at first estrus in Jaunpur and Sultanpur district were 12.396 ± 0.292 and 12.451 ± 0.300 months, respectively. The estrus duration was 23.962 ± 0.060 and 23.686 ± 0.125 hours, respectively for both the districts. The estrus cycle length, service period, kidding interval and gestation length for both the district were 21.056 ± 0.049, 21.627 ± 0.108, 54.357 ± 7.265, 56.875 ± 7.976, 204.687 ± 7.408, 206.041 ± 8.136 and 149.687 ± 0.146, 149.75 ± 0.113 days, respectively.

Keywods: Reproductive traits, Kidding interval, Age at first estrus, Jaunpuri goat

Introduction

Total goat population has been declined by 3.82% over the previous census and as per the 19th livestock census (2012) total goat population in the country is 135.17 million. It contributes 26.40% of total livestock population. It owes the ability to live under the most diverse condition of natural habitat and its flexible integration into dissimilar socio-economic situation for having quite definite physiological characteristics associated with high economic viability. There has been no serious attempt for description, evaluation, conservation and genetic improvement of goat breeds.

Jaunpuri goat, one of the neglected goat breed of India is found in the belt between Ganga and Gomati rivers of Eastern Uttar Pradesh. Jamunapari breed of goat was used to evolve this breed by crossing with the local non-descript goats of the region (Saraswat, 2001). It is not yet considered as a well-established goat breed of the country due to lack of scientific literature about this breed (Acharya, 1982). Systematic evaluation and characterization of their performance in its native tract is the pre-requisite for its inclusion in the list of the established breed. It will also prevent degeneration of this important indigenous goat of the country. Therefore, the present study was envisaged to evaluate the reproductive performance of Jaunpuri goats in its native tract.

Materials and Methods

The present study was conducted in two districts of eastern Uttar Pradesh viz. Jaunpur and Sultanpur. Seven villages from Jaunpur and eight villages from Sultanpur have been randomly selected. 17 farmers and 53 goats from Jaunpur and 15 farmers and 51 goats from Sultanpur district, as well as 34 bucks from both the district were selected for present investigation.

Data was subjected to statistical analysis using standard formulae (Snedecor and Cochran, 1994).

Results and Discussion

The mean values of various reproductive traits in female Jaunpuri goats from its home tract are presented in table1.

Age at first estrus: The mean value of age at first estrus of Jaunpuri does was 12.42±0.21 months. The findings indicated that the does of the two districts had almost similar age at first estrus. Rahman *et al.* (1977) also reported almost similar age (10.26±1.78 months) at first estrus in Black Bengal goats. However, Khan *et al.* (1981) and Giri *et al.* (2009) observed higher mean values (16 months) of this trait in Jamunapri and Black Bengal goats, respectively.

Estrus cycle and its duration: The mean value of first estrus cycle length of Jaunpuri does was 21.34±0.06 days. No significant difference was observed in the estrus cycle length of the does between the two districts. The mean value of estrus duration of this goat was 23.83±0.07 hrs. The findings indicated no significant difference between the does of the two districts in their average estrus duration.

Age at first tupping and Kidding: The age at first tupping and kidding of Jaunpuri goats averaged 13.12±0.22 and 18.21±0.23 months, respectively. The does of the two districts show no significant differences in these two traits. Saraswat (2001) reported the average age at first kidding in Jaunpuri goats maintained at the farm condition as 678 days. The present estimate of average age at first kidding in Jaunpuri goats is lower than that in Barbari (Dutt, 1968) and Jamunapri (Roy, 1995 and Roy *et al.*, 1989). However, Giri *et al.* (2009) observed lower age at first kidding as 12.3±0.01months in Black Bengal goats.

Service period: In Jaunpuri goats, the average service period was 55.63±5.36 days. The results suggested that the goats of the two districts studied has almost similar service period.

Number of services per conception: The number of services per conception of Jaunpuri goat averaged 1.85±0.07. The findings revealed that the does of the two districts requires almost two services for a successful conception.

Kidding interval: The mean value of kidding interval of Jaunpuri goat was 205.36±5.46 days. The does of the two districts did not show any significant difference in this trait. However, in Jaunpuri goats, Saraswat (2001) reported the average kidding interval as 235 days. The present findings is comparable with those in Black Bengal (206.7±3.12 days) (Giri *et al.*, 2009) and Jamunapari (229.30±26.76 days) (Khan *et al.*, 1981) goats. However, higher mean values were reported by Roy (1995) in Jamunapari (335±0.80 months) and Alam *et al.* (2009) in Beetal (332.81±6.80 months).

Gestation length: The gestation length of Jaunpuri goats averaged 149.72±0.05 days. Does of both districts studied had almost similar duration of gestation. Saraswat (2001) reported it as 146 days in Jaunpuri goats maintained at organized farm.

Type of Kidding: The results revealed that in Jaunpuri goats, twinning was the highest (61.48 %), followed by single (36.58 %), indicating that twinning is very common in this native breed of goat. The incidence of triplet was very rare (1.95 %). Acharya (1982) also reported similar twinning percentage of 64.12±9.4 % in Barbari goats, but lower in Jamunapri goats (27.8±6.46 %) than the present estimate. In Black Bengal goats, Giri *et al.* (2009) observed higher twinning rate (50.4 %) than single births (45.2 %) as observed in the present study.

Male Reproductive Traits

The mean values of various reproductive traits in male Jaunpuri goats collected from its home tract are presented in table 2.

Age at first tupping: The results revealed that the mean value of age at first tupping of Jaunpuri buck was 12.46±0.37 months. No significant difference was observed between the bucks of the two districts in their average first tupping age.

Scrotum Circumference: The scrotum circumference of male goats of the age groups 0-3, 3-6, 6-9, 9-12 and >12 months averaged 1.70±0.08, 3.50±0.50, 16.17±0.73, 16.88±0.88 and 18.00±0.70 cm,

VOL. VIII, SPECIAL ISSUE, RKVY NOV 2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY ON MORPHOMETRIC, WOOL AND REPRODUCTIVE TRAITS OF LOCALLY NON-DESCRIPT SHEEP OF FAIZABAD DISTRICT OF UTTAR PRADESH

Vikash Chand, V.K. Singh* and M. K. Verma

Department of Animal Genetics & Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, U.P.

Abstract

The present study was conducted to evaluate the morphometric traits such as physical characteristics, production and reproduction performance of locally available non-descript sheep in Faizabad district in field condition. A suitable questionnaire was used as per breed descriptor to collect various informations. Eighteen farmers and 611 non-descript sheep from district Faizabad were selected for investigation. Information about morphometric traits, production and reproduction performance, various socioeconomic such as land holding capacity, family size, numbers of family members and female engaged in sheep farming income from sheep farming etc. and managemental practices followed by sheep farmers were collected by personal interaction with farmers. As the sheep were of different ages, the data for body weight and measurement have been classified into various groups viz., 0-3, 3-6, 6-9, 9-12, 12-24, and above 24 months. The data collected during the study were subjected to statistical analysis using suitable formulae(Snedecor and Cochran, 1994) & Wool evaluation had perform at CSWRI, Avikanagar, Rajasthan. The common coat colour of locally available non-descript sheep of Faizabad district were white, white with black/brown face with black and white colour of hoof &horn. Ear were small or ill developed (Rudimentary). Horn is present only in male, prominent with backward & downward in direction. The overall average body weight of male sheep of age groups 0-3, 3-6, 6-9, 9-12, 12-24, >24 months was found to be as 12.60 ± 0.24, 15.90 ± 0.13, 19.00 ± 0.18, 21.12 ± 0.10, 30.94 ± 0.76 and 34.50 ± 0.76 kg respectively. The corresponding values for females are 10.04 ± 0.23, 13.62 ± 0.12, 16.34 ± 0.11, 19.26 ± 0.10, 24.01 ± 0.91, and 28.03 ± 0.57 kg respectively. Wool quality is falling in coarse grade having higher percentage of hairy fibers, average quality for carpet/Durry application. The estimated value of wool diameter(micron), Hetero fiber%, Hairy fiber%, total medullation%, staple length(cm), bundle strength tenacity(g/tex), bundle strength elongation% are 39.42, 14.49, 45.44, 59.93, 5.3, 13.07, 11.5 respectively. The reproductive performance of sheep in male age at first mating(months), in female age at first mating(months), age at first oestrous(months), age at first lambing(months), lambing interval(months), estrous cycle duration(days) and service period(months) were 20.58± 0.30, 13.81±0.20, 8.41±0.25, 19.42± 0.29, 8.02 ±0.16, 17.13±0.12 and 3.06 ±0.11.

Key Words: Non-descript sheep, Morphometric traits, wool and Reproductive traits.

Introduction

India is a rich source of diverse ovine germplasm with 74 million sheep which is 6.8% of world sheep population (FAOSTAT 2010). There are 43 documented descript breeds of sheep in India by NBAGR in year 2018. Sheep with its multi facet utility (for meat, wool, skin, manure and to some extent milk) play an important role in the Indian agrarian economy. They are better adapted to arid and semi-arid tropics with marginal and sub-marginal lands, otherwise unfit for crop production. They are perhaps the most suitable small ruminants to utilize the sparse vegetation available in dry land areas through range land management and reseeded pastures. They have an excellent ability to survive over a prolonged period of drought and semi starvation and are less prone to extreme weather conditions, ectoparasites as well as other diseases.

The Indian Council of Agricultural Research (ICAR), India has established a National Bureau of Animal Genetic Resources (NBAGR) at Karnal to take up description, evaluation and conservation of the livestock genetic resources and suggest strategies for their long-term conservation. Efforts are being made at NBAGR Karnal to determine the latest status by compiling information on characteristics of indigenous breeds of sheep through surveys on native tracts. Additional activities on molecular characterization of indigenous sheep breeds are also well under way at NBAGR (Arora and Bhatia, 2003; Sodhi *et. al.*, 2003) in view of worldwide recognition of the need for analysis of genetic structure and relationships of sheep populations/breeds to conserve ovine diversity (Arranz *et. al.*, 1998, 2001; Saitbekova *et. al.*, 2001; Sun *et. al.*, 2004). Conservation of sheep genetic resources, not only national but an international issue, therefore, needs more attention to the present status of sheep biodiversity and outlining measures that are necessary if the goals of sheep diversity conservation and self-reliance are to be combined. Local & non-descript sheep in Faizabad district is white in colour and some sheep is white with black patches. The head is black or brown with white patches. The forehead is slightly convex. The female is polled, but male has prominent horns that is backward and downward direction. The ears are small or rudimentary in70%population. The litter size is mostly single but sometimes twin occur. The fleece is course. However, no proper scientific study has been so far to evaluate the genetic potential of local & nondescript sheep of Faizabad district. Due to this, no standard breed characteristics & phenotypic performance of this breed is yet to be established thus not included in the list of established breed of sheep in the country. Therefore, the present investigation was planned to draw the attention of scientist & shepherd towards the specialist of this sheep for providing recognition as an Indian sheep breed with the objectives to study the geographical distribution and the morphometric, wool and reproductive characteristics of local and non-descript sheep in Faizabad district.

Materials and Methods

The present study was conducted to evaluate the morphometric traits such as physical characteristics, production and reproduction performance of local and non-descript sheep in district Faizabad in the field condition. The survey was conducted in district Faizabad of its native tracts. Seven villages from Faziabad district had been randomly selected for the present investigation. Eighteen farmers and six hundred eleven sheep from Faizabad were selected for investigation. The data collected during the study were subjected to statistical analysis using suitable formulae (Snedecor and Cochran, 1994)

Results and Discussion

1.Morphomretric Traits:

1.1. Coat colour and colour of body extremities of non-descript sheep of Faizabad district

The proportions of five coats colours viz., White, white with black spots, white with brown spots, Black and Brown are 81.44, 6.12, 5.24, 4.09, and 3.11% respectively. There were two types of hoof and horn colours namely black and brown. The white, black and brown tails witch colours were 81.44, 11.26 and 7.20% respectively.

1.2. Body weight:

The overall average body weight of male sheep of age groups 0-3,3-6,6-9,9-12,12-24,>24 months was found to be as 12.60 ± 0.24, 15.90± 0.13, 19 .00± 0.18, 21.12 ± 0.10, 30.94 ± 0.76 and 34.50 ± 0.76 kg respectively. The corresponding values for females are 10.04 ± 0.23, 13.62 ± 0.12, 16.34 ± 0.11, 19.26 ± 0.10, 24.01 ± 0.91, and 28.03 ± 0.57 kg respectively. The estimates obtained in present study were close agreement with those reported by Taneja, (1968) in Marwari sheep. However, the estimates were lower than those reported by Bhat

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1425-1429

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 1425-1429**
Journal homepage: http://www.ijcmas.com

Original Research Article

Influences of Various Environmental Factors on Test Day Milk Yield in Murrah Buffaloes

S.P. Mishra[1], V.K. Singh[1], M.K. Verma[1]*, J. Singh[1] and Chandra Prakash[2]

[1]Department of Animal Genetics and Breeding, Collage of Veterinary Science & A. H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P., India
[2]Division of Animal Genetics, IVRI, Izatnagar, Uttar Pradesh, India
**Corresponding author*

Keywords

Non-genetic factors, Murrah buffalo, Four weekly test day milk yields, Peak yield

A B S T R A C T

The aim of present study was to find out the effect of various non-genetic factors on four weekly test day yield (WTDY), 305 days or less lactational milk yield (305MY) and peak yield (PY) in Murrah buffaloes. The data on 172 WTDY records of Murrah buffaloes calved from 2002 – 2011, collected from the dairy farm of NDUAT, Kumarganj, Faizabad Uttar Pradesh. To study the effect of non-genetic factors on WTDY, 305MY and PY, fixed model, least square maximal likelihood analysis was used for the analysis of data. The least square means for 305MY and PY were found to be 1931.37 ± 30.52 Kg and 11.15 ± 0.33 Kg respectively. The least square means of overall WTDY ranged from 3.37 ± 0.12 Kg (WTDY-11) in 40th week test day to 9.11 ± 0.15 Kg (WTDY-3) in 8th week test day. Analysis of variance showed that the difference were statistically significant ($P<0.05$) for the effect of season on 305MY and PY. The effect of period was significant ($P<0.05$) and PY and highly significant ($P<0.01$) on 305MY. The effect of lactation was significant ($P<0.01$) on 305MY.

Introduction

Dairying has become an important secondary source of income for millions of rural families and has assumed a most important role in providing employment and income generating opportunity. Now a days many countries adopts test day milk yields records in genetic genetic evaluation in place of 305 days or less lactational milk yield (305MY) and Total lactational milk yield of dairy animals. Presently India is the largest milk producing (approx 155.5 million tons) country (DAHD 2016). In Indian Dairying buffaloes play a vital role contributing about 51% of total milk produce in country. Murrah is the best buffalo breed with superior genetic potential for milk production. The total lactational milk yield is an old form of record keeping. The test day milk yield recording is an alternative and new form of record keeping, which is an economic and time saving proposition in field condition. Various advantages of using test day milk yield records are individual test day effect, more number of records per animal. The interval between records can be used for reducing generation interval, better adjustment of non genetic factors influencing the milk yield resulting to more accurate genetic evaluation of dairy animals. Although test day milk

VOL. VIII, SPECIAL ISSUE (B) AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY ON DIFFERENT LACTATION CURVE MODELS ON TEST DAY MILK YIELD IN MURRAH BUFFALO

S. P. Mishra, V.K. Singh, M. K. Verma,* J. Singh, A. K. Verma[1] and Chandra Prakash[2]
Department of Animal Genetics & Breeding, [1]Department of LFC, C. V. Sc. & A. H.,
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, U.P
[2]Division of Animal Genetics, IVRI, Izatnagar, Uttar Pradesh
*Corresponding Author: manojvet550@gmail.com

ABSTRACT

The present study was carried out on 172 lactation records of Murrah buffalo maintained at Livestock farm, NDUAT, Kumarganj, Faizabad under Network Project on Buffalo Improvement (AICRP) from 2002-2011. The four weekly test day milk yield were used to develop the best lactation curve for the 305 days lactation milk yield in Murrah buffaloes using four models viz. Gamma type function (Wood, 1967), Exponential function (Wilmink, 1987) and Quadratic model (Dave, 1971). The average weekly test day milk yield increased from 7.11 kg in 1st week to a peak yield of 9.91 kg in 8th week, and subsequently to 4.17 kg in 40th week according to Exponential function for overall records. The average weekly test day milk yield increased from 8.77 kg in 1st week to a peak yield of 11.55 kg in 8th week, and subsequently to 5.81 kg in 40th week as per Quadratic model for overall records. The gamma type function was observed slightly higher test day yield in first lactation than the least squares mean. However it was observed lower value in other lactations than the least square mean. The different lactation curve of lactation wise showed gamma function type gave the best fit results in all the lactations.

Key Words: *Lactation curve, Four weekly test day milk yield, ascending phase and descending phase.*

Introduction: There is different trends of milk secretion throughout the lactation of an animal, which can be invariably represented mathematically in the form of the lactation curve. In simple term the lactation curve can be defined as the graphical representation of milk yield against the time (Broody *et. al.*, 1923). There are three different stages of lactation curve. The ascending phase indicates the initial steep rise in the milk yield, which is usually linear. The peak yield along with persistent phase is the largest phase of the lactation, which represent the inherent capacity of animal for suitable milk production. The third phase is the decline phase, which is comparatively short. This phase is usually associated with the drying off stage of the animal. Various lactation curve models have been tried by different workers to fit the lactation curve in different cattle breeds (Singh *et. al.*, 2002; Cilek and Keskin, 2008; Rashia, 2010). The three models (Gamma function, Exponential Function and Quadratic function model) have been used for modeling of lactation curve in present study. The lactation curve models are also used to predict the yield of lactation at any point of the lactation. This property of the model can prove beneficial in case of incomplete records. Getting the test day information from field is not easy and there is every chance of missing the data due to certain inevitable reasons. In such cases these lactation models may prove very beneficial for prediction of these incomplete records. Lactation curve is a valuable tool in designing suitable breeding and managemental strategies for lactating animals. Hence, the present study is carried out on the four weekly test day milk yield data of Murrah buffalo maintained at NDUAT, Kumarganj, Faizabad under Network Project on Buffalo Improvement (AICRP) with objective to identify the best fit lactation curve model to test day milk yield data of Murrah buffalo.

Material and Method: the data utilized in present study was spread over a period of nearly 10 years from 2002 to 2011. The data of 172 four weekly test day milk yield (1st weekly test day milk yield-WTDY 1; 4th weekly test day milk yield-WTDY 2; 8th weekly test day milk yield-WTDY 3; 12th weekly test day milk yield-WTDY 4; 16th weekly test day milk yield-WTDY 5; 20th weekly test day milk yield-WTDY 6; 24th weekly test day milk yield-WTDY 7; 28th weekly test day milk yield-WTDY 8; 32th weekly test day milk yield-WTDY 9; 36th weekly test day milk yield-WTDY 10 and 40th weekly test day milk yield-WTDY 11) distributed in different parities as given as first lactation (44 records), 2nd lactation (29), 3rd lactation (34), 4th lactation (32) and 5th lactation (32). Selection of models were selected and fitted to the lactation curves for the five parities to determine the best model for each of the parity. The models used were as follows-

1. Gamma function model - Model 1 (Wood, 1967)
   $Yt = at^b e^{-ct}$
2. Exponential Function model –Model 2 (Wilmink, 1987)
   $Yt = a + bt + c\exp^{(-0.05t)}$
3. Quadratic model –Model 3 (Dave 1971)
   $Yt = a + bt + ct^2$

   Where,
   Yt = average test day milk yield in the tth week
   a = appropriate initial milk yield just after calving
   b = incline slope parameter upto peak yield
   c = decline slope parameter
   t = time of test day yield

the above mentioned models were fitted to milk yield for different parities. The most suitable model for different parities was identified on the basis of highest coefficient of determinant (R^2) value.

Result and Discussion: the 172 WTDY of different lactation were used to predict different WTDY by these above mentioned lactation curve models. The results are presented in table 2 for different lactation. The average four weekly test day milk yield increased from 6.17 Kg in 1st week (WTDY 1) to a peak yield of 8.91 Kg in 8th week (WTDY 3) and subsequently to 3.30 Kg in 40th week (WTDY 11) by Gamma function model (Model 1). The average four weekly test day milk yield increased from 7.11 Kg in 1st week (WTDY 1) to a peak yield of 9.91 Kg in 8th week (WTDY 3) and subsequently to 4.17 Kg in 40th week (WTDY 11) by Exponential function model (Model 2). The average four weekly test day milk yield increased from 8.77 Kg in 1st week (WTDY 1) to a peak yield of 11.55 Kg in 8th week (WTDY 3) and subsequently to 5.81 Kg in 40th week (WTDY 11) by Quadratic model (Model 3) for overall records presented in table 1.

The Gamma function (Model 1) was observed slightly higher WTDY in first lactation as compare to the least squares mean of actual observations. However it was observerd lower value in all other lactations than the least squares mean of actual observations. Quadratic model (Model 3) gave the highest value in all the lactation than the least square mean of actual observations. The Gamma function (Model 1) gave the best fit results in all the lactation with higher R^2 value. Similaraly Dongare *et. al.*, 2012, Cilek, and Keskin., 2008, singh and bhat., 1978, pande, 1983, olori *et. al.*, 1999, Yadav *et. al.*, 1977 and Kellong *et. al.*, 1977 found good fit Model 1 in different breeds of

Environment & Ecology 35 (2) : 611—613, April—June 2017
Website : environmentandecology.com ISSN 0970-0420

Factors Affecting Average Milk Protein Percentage in Sahiwal Cattle and Murrah Buffalo

M. K. Verma, G. K. Sachdeva, Alok Kumar Yadav, Chandra Prakash, Ajeet Kumar Verma

Received 10 May 2016; Accepted 16 June 2016; Published online 23 July 2016

Abstract India is a mainly agriculture country. In Indian agriculture, the vast and diverse livestock population plays a vital role in the rural economy. The present investigation was carried out using data on performance records spread over a period of 6 years (2005-2010), on 188 Sahiwal cows and 94 Murrah buffaloes maintained at ICAR-NDRI, Karnal, Haryana. The research was conducted to study the effect of various factors on average milk protein percentage in sahiwal cows and Murrah buffaloes. Least squares analysis was carried out to assess the effect of non-genetic factors namely season, period and parity on average milk protein percentage. The effect of season was found significant in sahiwal cows whereas non-significant in Murrah buffaloes; the effect of period was found to be significant in both species; the effect of Parity was found to be non-significant in both species.

Keywords Sahiwal, Murrah, Average milk protein percentage, Non-genetic factors.

M. K. Verma, G. K. Sachdeva, Alok Kumar Yadav
Division of Dairy Cattle Breeding, ICAR-National Dairy Research Institute, Karnal Haryana-132001, India

Chandra Prakash
Division of Animal Genetics, Indian Vetwrinary Research Institute, Izatnagar, Uttar Pradesh 243122, India

Ajeet Kumar Verma
Department of Livestock Production & Management, Colleage of Veterinary Science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad, Uttar Pradesh 224229, India
e-mail : manojvet550@gmail.com
*Correspondence

Introduction

Sahiwal cattle and Murrah buffalo play a vital role in the rural economy. There are various step has been taken for increasing lactational milk yield, however, other important aspect of milk production i.e. milk constituents received little attention in livestock imrovement programs. Presently to establish a profitable and sustainable dairy industry, we must have producer animal in term of quantity and quality of milk. Although Sahiwal cows and Murrah buffaloes are very good milk producing dairy animals but their milk production, composition and reproduction efficiency varied under different management and environment regime [1]. Therefore, quality of milk should be considered in present day breed inprovement programme. To enhance quality milk production of a dairy animal, it is necessary to de-

Indian J. Anim. Res., 51 (2) 2017 : 387-390
Print ISSN:0367-6722 / Online ISSN:0976-0555

AGRICULTURAL RESEARCH COMMUNICATION CENTRE
www.arccjournals.com/www.ijaronline.in

Effect of genetic and non-genetic factors on milk yield and milk constituents in Murrah buffalo

M.K. Verma, G.K. Sachdeva, Alok Kumar Yadav*, S. Gautam[1], M.M. Ali[2] and Santosh Kumar[3]

Division of Dairy Cattle Breeding,
ICAR-National Dairy Research Institute, Karnal-132 001, India.
Received: 31-07-2015 Accepted: 18-11-2015 DOI: 10.18805/ijar.9297

ABSTRACT

The present study was carried on milk production and milk constituents of 444 lactations of 176 Murrah buffaloes over a period of 10 years from 2001 to 2010 with the objective to find out the effect of various genetic and non-genetic factors on milk yield and milk constituents traits in Murrah buffaloes. Data on total milk yield, milk yield in 305 days or less, lactational average fat per cent and lactational average solid not fat percent (LSA) were collected and compiled purposely and analyzed with suitable statistical tool. Overall least square mean for all lactation traits of total milk yield (TMY), milk yield in 305 days or less (305MY), lactational average fat % (LFA) and lactational average solid not fat % (LSA) were 2253.88 ± 70.15 Kg, 2097.11 ± 59.12 Kg, 7.97 ± 0.02 % and 9.64 ± 0.01 % respectively. The period has significant effect on milk yield and milk constituent traits. Sire and parity affects significantly to TMY and 305MY, however, seasons were affecting to TMY only. Hence it is concluded as milk constituents (LFA and LSA) not affected by sire, parity and season. Although, sire and parity has affect on TMY and 305MY whereas season affects only TMY, therefore, due importance should be given to sire and parity during selection and genetic improvement of Murrah buffalo. Analysis among the parities also revealed that there were no significant (P≥0.05) difference among the second, third and fourth parity hence, at the time of selection second lactation (305MY) milk yield is equally important as fourth lactation in which highest milk yield has been reported in present study.

Key words: Genetic factors, LFA, LSA, Mixed model, Non-genetic factors, TMY, 305MY.

INTRODUCTION

Murrah buffalo is a pride of nation and best in the world. Although, India's buffaloes population are increasing steadily however, it possess only 20.49 million out of 105.34 million of total buffalo population (Livestock census, 2008). Murrah buffalo plays a vital role in the rural economy through milk, meat and animal power. Although Murrah is best and highest milk producing breed of buffalo but its milk production, composition and reproduction efficiency varied under different management and environment regime (Bishnoi and Singh 2009). Although, higher milk yield and quality milk is a key factor for successful and profitable dairy farming however, genetic improvement to increasing the milk productivity of dairy animals through augmenting the lactational milk yield has been emphasized so far. But, milk constituents have equal importance, nowadays, for consumer and processing industries. Therefore, quality of milk should be considered in present day breed improvement programme. To enhance productivity of a dairy animal, it is necessary to develop an understanding of the factors affecting its milk production and composition. Milk production and composition traits affecting by genetic and non-genetic factor therefore, determining the genetic and non-genetic estimate and correlation of parameters might be helpful in determining the method of selection to predict direct and correlated response to selection, choosing a breeding system to be adopted for future improvement as well as in the estimation of genetic response. Several studies have reported genetic parameter estimates for buffalo milk yield (Afzal *et al.* 2007, Sahoo *et al.* 2014) but, literature in Murrah buffalo milk components is scanty therefore, the present investigation was undertaken with the objective to study the effect and influence of genetic and non-genetic factors on milk yield and milk constituents traits of Murrah buffalo.

MATERIALS AND METHODS

Data pertaining to milk production and milk constituent traits were collected from history sheets and milk constituent's registers of 176 Murrah buffalo comprising 444 lactations spread over a period of 10 years from 2001 to 2010 from Dairy Cattle Breeding division, NDRI Karnal, Haryana. Milk production and milk constituent traits considered in the present study were total milk yield (TMY), milk yield in 305 days or less (305MY), lactational average fat % (LFA) and lactational average solid-not-fat % (LSA). Collected data were classified in Five periods [1st (2001-2002), 2nd (2003-2004), 3rd (2005-2006) 4th (2007-2008) and

*Corresponding author's e-mail: alokvet3842@gmail.com; [1]Division of D.C.N., [2]L.P.M., Section, ICAR-NDRI, Karnal, Haryana, India.
[3]SMS Krishi Vigyan Lohit, Arunachal Pradesh, India.

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(4): 729-731
© 2021 TPI
www.thepharmajournal.com
Received: 05-02-2021
Accepted: 08-03-2021

Piyush Kumar Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya (UP), India

VN Rai
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya (UP), India

Neeraj Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya (UP), India

Sunil Kumar
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya (UP), India

Vishva Deepak Chaturvedi
Department of Genetics & Plant Breeding, CSK HPKV Palampur, Himachal Pradesh, India

Corresponding Author:
Piyush Kumar Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya (UP), India

Effect of weather variables on the yield of wheat crop in District Jaunpur, Eastern Uttar Pradesh, India

Piyush Kumar Singh, VN Rai, Neeraj Singh, Sunil Kumar and Vishva Deepak Chaturvedi

Abstract
India is an important centre of wheat cultivation. The wheat is cultivated on the largest areas in India. wheat is the major crop of Uttar Pradesh, which covers about 32.5 per cent area of total gross-cropped area in Uttar Pradesh. The present study mainly deals with the effect on weather variables. The study has been undertaken for wheat crop in the district Jaunpur, Eastern Uttar Pradesh, India. The present study is formulated to determine the individual effect of weather variables on wheat yield. On the basis of R^2, we found that individually Maximum Temperature is more important with 62.7 followed by sunshine (hr.), rainfall, wind velocity and Minimum Temperature with 61.3, 52.0, 30.4 and 27.9 respectively.

Keywords: Weather variables, significant Correlation & Regression, Yield, wheat crop, R^2.

Introduction
In India, wheat crop is grown mainly in the northern states, with Uttar Pradesh being the top-most contributor of wheat with a total production of 25.22 million tonnes, followed by Punjab (15.78 MT) and Madhya Pradesh (14.18 MT). It is interesting to know that despite being the highest producer of wheat and having the largest land under wheat cultivation in India (9.85 million hectares), Uttar Pradesh productivity (2561 kg/ hectare) is still less than the national average. But Punjab with 4491 kg/ hectare beats every other state in terms of productivity!
Wheat crop is usually sown from months of September to December in various states of India depending upon the suitable climate, and the harvesting is done from February to May depending upon the climate as well as the time it is seeded. The temperature required for sowing ideally should be the winter temperature of 10°C-15°C and summer temperature of 21°C-26°C. The temperature at sowing needs to be low while at the harvesting time, higher temperatures are necessary for the proper ripening of Wheat.
Being a plant, pests and diseases have always been a problem, although, with the use of pest and disease resistant varieties and pesticides, the yield has increased phenomenally. Some common pests that affect the wheat cultivation are Stripe Rust /Yellow Rust, Powdery Mildew, Aphids, Head Scabs, Army Worm, Termites etc. Most of them can be taken care of with some added vigil and judicious use of pesticides.
Environment plays an important role in crop production. The eastern U.P. has different environment and ecology as compared to other parts of the state and country. The study has been undertaken for wheat crop in the district of Jaunpur, Uttar Pradesh, India. The district of Jaunpur is situated in the North-West part of Varanasi Division. The rivers Gomti and Basuhi divide the district into nearly four equal landmasses. The soils are mainly sandy, loamy and clayey. Jaunpur district is often affected by the disaster of floods that is why there is a paucity of minerals. Excavations at some places yield to some rocks which are burnt to make lime. The lime obtained from sand and gravel is used in buildings construction work. The economic development of the district is mainly dependent on agriculture.

Material and Methods
The time series data on yield for wheat crop of Jaunpur district of eastern Uttar Pradesh pertaining for the period from 2000-01 to 2017-18 have been procured from the website.
http://updes.up.nic.in/spatrika/spatrika.htm by Economics and Statistics Division, Planning Department, Government of Uttar Pradesh.
Weekly weather variables wheat crop in the district of Jaunpur, Eastern Uttar Pradesh have

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; 9(2): 256-258
© 2021 IJCS
Received: 08-01-2021
Accepted: 21-02-2021

Piyush Kumar Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Rai
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sunil Kumar
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Vishva Deepak Chaturvedi
Department of Genetics and Plant Breeding, CSK HPKV Palampur, Himachal Pradesh, India

Corresponding Author:
Piyush Kumar Singh
Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of weather variables on the yield of rice crop in District Jaunpur, Eastern Uttar Pradesh, India

Piyush Kumar Singh, VN Rai, Neeraj Singh, Sunil Kumar and Vishva Deepak Chaturvedi

DOI: https://doi.org/10.22271/chemi.2021.v9.i2d.11817

Abstract
India is an important centre of rice cultivation. The rice is cultivated on the largest areas in India. Rice is the major crop of Uttar Pradesh, which covers about 36.5 per cent area of total gross-cropped area in Uttar Pradesh. The present study mainly deals with the effect on weather variables. The study has been undertaken for rice crop in the district Jaunpur, Eastern Uttar Pradesh, India. The present study is formulated to determine the individual effect of weather variables on rice yield. On the basis of R^2, we found that individually Maximum Temperature is more important with 57.8 followed by sunshine (hr.), rainfall, Minimum Temperature, and wind velocity with 54.2, 52.2, 30.1 and 5.32 respectively.

Keywords: Weather variables, correlation & regression, yield, rice crop, R^2

Introduction
In India rice is grown in 43.86 million ha, the production level is 104.80 million tones and the productivity is about 2390 kg/ha (Agricultural Statistics at a glance- 2015). It is grown under diverse soil and climatic conditions the productivity level of rice is low compared to the productivity levels of many countries in the world. Also, about 90% of the cultivated land belongs to Marginal, Small and Medium farmers which is another constrain in increasing the productivity of rice in the country. It is, therefore, there is ample scope to increase the productivity of rice in the country. The highest productivity is 6710 kg per ha of China followed by Vietnam (5573 kg /ha), Indonesia (5152 kg/ha), Bangladesh (4375 kg/ha) etc There are improved technologies and various interventions which could be adapted to increase the productivity in the country. Cultivation of hybrid rice has potential to increase the productivity and needs to be promoted. A lot of work has been done by IASRI, New Delhi in this direction in different locations of the country. The discriminant function has also been used to forecast Preharvest yield of rice by Agrawal (2002) using weather variables.
The majority of the agriculture land is used to grow major cereal crops; rice and wheat. Rice is the major crop in Uttar Pradesh and is grown in about 5.90 Mha which comprises of 13.5% of total rice in India. Uttar Pradesh has favorable and suitable climate, vast areas of fertile soils, sunshine and adequate water resources. Te cropping intensity is 153% of the Uttar Pradesh. Uttar Pradesh ranks 3rd in the country in production of rice.
Environment plays an important role in crop production. The eastern U.P. has different environment and ecology as compared to other parts of the state and country. The study has been undertaken for rice crop in the district of Jaunpur, Uttar Pradesh, India.

Material and Methods
The time series data on yield for rice and wheat crop of Jaunpur district of eastern Uttar Pradesh pertaining for the period from 2000-01 to 2017-18 have been procured from the website http://updes.up.nic.in/spatrika/spatrika.htm by Economics and Statistics Division, Planning Department, Government of Uttar Pradesh.
Weekly weather variables data for rice and wheat crop in the district of Jaunpur, Eastern Uttar Pradesh have been obtained from the National Data Centre, India Meteorological Department, Pune for the study period 2000-01 to 2017-18.

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(6): 1015-1017
© 2021 TPI
www.thepharmajournal.com
Received: 14-03-2021
Accepted: 23-05-2021

Neeraj Singh
Department of Agriculture Statistics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Piyush Kumar Singh
Department of Agriculture Statistics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Rai
Department of Agriculture Statistics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

BVS Sisodia
Department of Agriculture Statistics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Neeraj Singh
Department of Agriculture Statistics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of weather variables on the yield of wheat crop in District Azamgarh of Eastern Uttar Pradesh, India

Neeraj Singh, Piyush Kumar Singh, VN Rai and BVS Sisodia

Abstract
Wheat (*Triticum aestivum* L.) is the major crop of Uttar Pradesh, which covers about 36.5 per cent area of total gross-cropped area in Uttar Pradesh. The present study mainly deals with to determine the effect of weather variables on the yield of Wheat crop in Azamgarh district of Eastern Uttar Pradesh, India. On the basis of correlation and regression analysis, we found that rainfall is most important variable which effects the yield of Wheat crop positively followed by minimum temperature while rest variables show negative effects on the yield of Wheat crop.

Keywords: Azamgarh, wheat, yield, weather variables, correlation, regression, r-square

Introduction
Wheat (*Triticum aestivum* L.) is the major crop of Uttar Pradesh, which covers about 32.89 per cent area of total gross-cropped area and contributes 31.92 per cent production of India in 2017-18, (DAC&FW, 2018). Wheat is mostly grown in Rabi (December-April) season. This crop is also studied under the FASAL programme of the Department of Space (Parihar & Oza, 2006). Due to importance of this crop in the national agricultural scenario, it is important to study the impact of climate change on this crop.

Azamgarh district (Eastern Uttar Pradesh, India) which falls under middle gangetic agro-climatic region and 8th eastern plain agro-climatic zone in the eastern part of Uttar Pradesh at a distance of about 270 km from Lucknow. Azamgarh district lies between latitude 26° 03' N and longitude 83° 13' E and it is bounded by the districts of Mau in east, Gorakhpur in the north, Ghazipur in south-east, Jaunpur in the south-west, Sultanpur in the west and Ambedkar Nagar in the north-west.

The present study has been undertaken for the yield of Wheat crop in the district Azamgarh, Eastern Uttar Pradesh, India.

Material and Methods
The time series data on yield for Wheat crop of Azamgarh district of eastern Uttar Pradesh pertaining for the period from 2000-01 to 2017-18 have been procured from the website http://updes.up.nic.in/spatrika/spatrika.htm by Economics and Statistics Division, Planning Department, Government of Uttar Pradesh.

Weekly weather variables data for Wheat and wheat crop in the district of Azamgarh, Eastern Uttar Pradesh have been obtained from the National Data Centre, India Meteorological Department, Pune for the study period 2000-01 to 2017-18. The data for Wheat crop have been collected up to the first 16 weeks of the crop cultivation which include 44th Standard Meteorological Week (SMW) to 7th SMW of the next year. The data on six weather variables *viz*. Maximum Temperature, Minimum Temperature, Rainfall, wind-velocity and Sun-shine hours have been used in the study.

Individual effect of weather variables
The statistical models have been proposed by expressing effect of changes in weather variables on yield in wth week as a linear function of respective correlation coefficients between detrended yield and weekly weather data (Agrawal *et al*., 1986). Trend effect on yield is also removed from yield while calculating correlation coefficients of yield with weather variables to be used as weights.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2021; 9(2): 259-261
© 2021 IJCS
Received: 07-12-2020
Accepted: 15-01-2021

Neeraj Singh
Department of Agricultural Statistics, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Piyush Kumar Singh
Department of Agricultural Statistics, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VN Rai
Department of Agricultural Statistics, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sunil Kumar
Department of Agricultural Statistics, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Neeraj Singh
Department of Agricultural Statistics, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of weather variables on the yield of rice crop in district Azamgarh of eastern Uttar Pradesh, India

Neeraj Singh, Piyush Kumar Singh, VN Rai and Sunil Kumar

DOI: https://doi.org/10.22271/chemi.2021.v9.i2d.11818

Abstract
Rice (*Oryza sativa* L.) is the major crop of Uttar Pradesh, which covers about 36.5 per cent area of total gross-cropped area in Uttar Pradesh. The present study mainly deals with to determine the effect of weather variables on the yield of rice crop in Azamgarh district of Eastern Uttar Pradesh, India. On the basis of correlation and regression analysis, we found that rainfall is most important variable which effects the yield of rice crop positively followed by minimum temperature while rest variables show negative effects on the yield of rice crop.

Keywords: Azamgarh, rice, yield, weather variables, correlation, regression, r-square

Introduction
Rice (*Oryza sativa* L.) is the major crop of Uttar Pradesh, which covers about 36.5 per cent area of total gross-cropped area in Uttar Pradesh. In 2015-16, contributing around 41.5 per cent to the total food grain production of the country (DES, 2017). Rice is mostly grown in Kharif (June-October) season. This crop is also studied under the FASAL programme of the Department of Space (Parihar & Oza, 2006) [3]. Due to importance of this crop in the national agricultural scenario, it is important to study the impact of climate change on this crop.
Azamgarh district (Eastern Uttar Pradesh, India) which falls under middle gangetic agro-climatic region and 8th eastern plain agro-climatic zone in the eastern part of Uttar Pradesh at a distance of about 270 km from Lucknow. Azamgarh district lies between latitude 26°03' N and longitude 83°13' E and it is bounded by the districts of Mau in east, Gorakhpur in the north, Ghazipur in south-east, Jaunpur in the south-west, Sultanpur in the west and Ambedkar Nagar in the north-west.
The present study has been undertaken for the yield of rice crop in the district Azamgarh, Eastern Uttar Pradesh, India.

Material and Methods
The time series data on yield for rice crop of Azamgarh district of eastern Uttar Pradesh pertaining for the period from 2000-01 to 2017-18 have been procured from the website http://updes.up.nic.in/spatrika/spatrika.htm by Economics and Statistics Division, Planning Department, Government of Uttar Pradesh.
Weekly weather variables data for rice and wheat crop in the district of Azamgarh, Eastern Uttar Pradesh have been obtained from the National Data Centre, India Meteorological Department, Pune for the study period 2000-01 to 2017-18. The data for rice crop have been collected up to the first 16 weeks of the crop cultivation which include 23rd Standard Meteorological Week (SMW) to 38th SMW of a year. The data on six weather variables *viz*. Maximum Temperature, Minimum Temperature, Rainfall, wind-velocity and Sun-shine hours have been used in the study.

Individual effect of weather variables
The statistical models have been proposed by expressing effect of changes in weather variables on yield in wth week as a linear function of respective correlation coefficients between detrended yield and weekly weather data (Agrawal *et al*., 1986) [2].

Int.J.Curr.Microbiol.App.Sci (2020) *9*(12): 1214-1220

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 12 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.912.149

Growth Rate of Rice Crop in Varanasi Division of Eastern Uttar Pradesh, India

Piyush Kumar Singh[1], Neeraj Singh[1], V.N. Rai[1], Sunil Kumar[1] and Vishva Deepak Chaturvedi[2]*

[1]Department of Agricultural Statistics, Acharya Narendra Dev University of Agriculture and Technology, Kumarganj – Ayodhya (UP) 224229 India
[2]Department of Genetics & Plant Breeding, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur (HP) 176062 India, India

**Corresponding author*

Keywords

Rice, Trends, CAGR, Instability Index, Decomposition analysis

Article Info

Accepted:
10 November 2020
Available Online:
10 December 2020

A B S T R A C T

The present paper attempts to analyze the growth rate for Area, Production and Productivity of Rice crop in Varanasi Division of Eastern Uttar Pradesh. The time series data on area, production and productivity of wheat crop pertaining from "Sankhyakiya Patrika" to the period 2000-01 to 2014-15 were used for the study. The per cent change was estimated on the basis of triennium average for area, production and productivity which is increased substantially with 5.19, 15.90 and 10.20 per cent respectively. Graphical presentations have shown the trends in area, production and productivity of Rice. The growth rate was examined by Compound Annual Growth Rate (CAGR), which is 0.307 per cent for area, 1.559 per cent for production and for its productivity 1.247 per cent. Decomposition analysis shows the dominant effect of productivity for the growth in rice production.

Introduction

Varanasi division is an administrative geographical unit of Uttar Pradesh of northern India. Varanasi is the administrative headquarter of the division. Division consists of district of Varanasi, Jaunpur, Gazipur and Chandauli Varanasi district lies between latitude 25 20' N and longitude 83 00' E. The district covers an area of 1535 square kilometers. It is bounded by Jaunpur district to the north Ghazipur and Ballia district in the east, Mirzapur and Chandauli district to the south and Gyanpur to the west. According to the Department of National Economics and Statistics (2015) during 2012-13 and 2013-14,

Int.J.Curr.Microbiol.App.Sci (2018) 7(5): 2429-2434

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 7 Number 05 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.705.279

Growth in Potato Production: A Zone Wise Analysis in Eastern Uttar Pradesh, India

Ekta Pandey*, V.N. Rai, Neeraj Singh and Piyush Kumar Singh

Department of Agricultural Statistics, College of Agriculture, Narendra Dev University of Agriculture and Technology, Kumarganj – Faizabad (UP), 224-229, India

**Corresponding author*

Keywords

Potato, Agro-climatic zones, Graphical analysis, Linear Growth Rate (LGR), Compound growth rate (CGR), Instability index

Article Info

Accepted:
18 April 2018
Available Online:
10 May 2018

A B S T R A C T

The paper analyses the growth and instability in terms of area, production and productivity of potato in Eastern Uttar Pradesh. The growth was examined by Compound growth rate and Simple growth rate. The study relates to 1980-81 to 2014-15 which is further divided into four sub-periods. The area under potato registered positive growth rate throughout the period in Vindhyan Zone. The productivity of potato was found to be highest in North Eastern Plain Zone where as lowest in Eastern Plain Zones.

Introduction

Agriculture in India has a significant history. Today India ranks second worldwide in farm output. India has shown a steady average nationwide annual increase in the kilograms produced per hectare for various agricultural items, over the last 60 years. These gains have come mainly from India's green revolution, improving road and power generation infrastructure, knowledge of gains and reforms. The state is divided into 9 agro-climatic zones - Tarai Region, Western Plain Region, Central Western Region, South Western Region, Central Plain Region, Bundelkhand Region, North Eastern Plain Region, Eastern Plain Region and Vindhyachal Region. The study relates to the Eastern Uttar Pradesh which covered different three Agro- climatic zones viz. North Eastern Plain Zone, Eastern Plain Zone, and Vindhyan Zone. North Eastern Plain Zone constitute 11 districts viz. Basti, Bahraich, Balrampur, Deoria, Gorakhpur, Gonda, Mahrajganj, Kushinagar, Siddhartha Nagar, Sant Kabir Nagar and Shravasti. Eastern Plain Zone constitute 11 Districts viz. Azamgarh, Ambedkar Nagar, Barabanki, Ballia, Chandauli, Faizabad, Ghazipur, Mau, Jaunpur, Sultanpur, and Varanasi. In Vindhyan Zone constitutes three districts viz. Mirzapur, Sonbhadra, and Sant Ravidas Nagar.

In the agro-climatic zones of eastern Uttar

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 3136-3138
Received: 13-01-2018
Accepted: 14-02-2018

Neeraj Kumar Maurya
Department of Fruit Science, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Bhanu Pratap
Department of Fruit Science, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Abhinav Kumar
Department of Floriculture and Landscaping, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Dheeraj Yadav
Department of Fruit Science, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Shiv Praksh Shrivastav
Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Abdul Mazeed
IIAST, Intergal University, Dasauli, Lucknow, Uttar Pradesh, India

Correspondence
Neeraj Kumar Maurya
Department of Fruit Science, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Effect of zinc sulphate and gibberellic acid on chemical attributes of winter season guava (*Psidium guajava* L.) *Cv.* Allahabad safeda

Neeraj Kumar Maurya, Bhanu Pratap, Abhinav Kumar, Dheeraj Yadav, Shiv Praksh Shrivastav and Abdul Mazeed

Abstract
The present investigation was carried out at the Effect of Zinc sulphate and Gibberellic acid on Chemical attributes of Winter Season Guava (*Psidium guajava* L.) cv. Allahabad Safeda" at the Main Experiment Station, Department of Horticulture, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during the year 2015-2016. The experiment was conducted in Randomized Block Design with seven treatments and replicated in three times, considering one plant as a unit. The observations were recorded for chemicals attributing characters of guava fruits. The maximum fruit size (6.30), weight (110.21), volume (110.35) and diameter (6.87) were recorded with foliar application of GA_3@150ppm. Better quality fruits with respect to highest specific gravity (0.998) were recorded with GA_3@150ppm. The fruit yield was also recorded maximum with the combined spray of GA_3@150ppm. Overall it can be concluded that application of GA_3@150ppm judged the best for higher fruit yield, production and better fruit quality of guava.

Keywords: zinc sulphate, gibberellic acid, total soluble solid, acidity, ascorbic acid and total sugars

Introduction
Guava (*Psidium guajava* L.), "the apple of the tropics", is one of the most common fruits in India. The guava belongs to the family 'Myrtaceae'. It is originated from tropical America and is a subtropical, hardy, evergreen fruit tree. The Guava covers an area of 2.20 Lac ha. Bihar has largest area covering about 29.2 thousand ha. followed by Uttar Pradesh (39.9 thousand ha.) and Karnataka (7.2 thousand ha.) The average productivity of guava is 12 mt/ha. The productivity is higher in M.P, i.e. 29 mt/ha (Misra and Singh, 2005). Guava produced in Allahabad region of U.P. is best in the quality in the world (Chadha, 2001). It is highly tolerant to alkaline and saline soils and it can be grown successfully even upto pH 8.5, it can withstand to the maximum temperature at 46°C, even with scantly rainfall of less than 25 cm. Guava in one of the cheapest and good source of Vitamin-C and pectin. The ripe guava contains 86.9% moisture, 19.3% dry matter, 0.76% ash, 0.40% crude fat, 1.13% crude protein and 6.2% crude fiber but its composition varies widely with cultivars, stage of maturity and season (Ghosh and Chattopadhyay, 1996) [4]. They also content 8.2 to 10.5 0Brix total soluble solids, 4.9 to 10.1 per cent total sugar content, 0.22 to 0.39 per cent acidity and 260 mg/100g of fruit pulp content ascorbic acid (Mitre, 1999) with good amount of iron, calcium and phosphorus. In northern India, guava flowers mainly twice in a year, April-May which provides the crop in. rainy season, whereas, August-September flowering gives the winter season crop. In Maharashtra and Tamil Nadu, there is a third crop produced with flower appearing in October-November. The natural fruits setting in guava are quite high (80-86%) of which only 34-36% fruit reach maturity. Guava fruits are consumed either fresh or processed in the form of product like jam, jelly, nectar and good quality RTS beverages. The rainy season crop of guava is rough, insipid, poor in quality, less nutritive and it is attacked by several insect-pest and diseases. On the other hand, winter season crop is superior in quality, free from the pest and diseases, having long storage life. It further needs improvement in nutritive value, market value and demand so that it fetches more prices in market as compared to the rainy season crop. Recently it was observed that foliar application of plant growth regulator (GA_3) exerted favorable effect on the physico--chemical characters of guava fruits at harvest (Kher *et al*., 2005) [5]. Micronutrients such as Zinc play important role in growth and development of fruits, vegetables and cereals. It is one of the essential elements for the formation of chlorophyll and hence useful towards photosynthetic activity. Zinc is a constituent of some enzymes and possibly takes part in synthesis on Indol Acetic Acid in plant. The objective of study is to find out the effect of

STM JOURNALS

Research & Reviews: Journal of Agricultural Science and Technology
ISSN: 2278-2206 (Online), ISSN: 2349-3682 (Print)
Volume 8, Issue 3
www.stmjournals.com

Integrated Effect of Bioagents along with FYM on Pokkah Boeng Disease of Sugarcane

*Seweta Srivastava[1], Vinit Pratap Singh[2], Meenakshi Rana[1], Pavithra G.[1], Debjani Choudhury[1]**

[1]School of Agriculture, Lovely Professional University, Phagwara, Punjab, India
[2]College of Agriculture, Azamgarh Campus, ANDUA&T, Faizabad, Uttar Pradesh, India

Abstract

Sugarcane production in various regions of the country is affected by different biotic and abiotic stresses. Among the biotic constraints, there are many diseases such as red rot, wilt, grassy shoot, pineapple disease, smut, leaf scald and pokkah boeng disease. Amongst the foliar diseases, the pokkah boeng disease is becoming a major disease of sugarcane. Pokkah boeng is frequently associated with sett rot or stem rot disease as both are caused by the same causal organism that is, Fusarium moniliforme. The pathogen affects the economically valuable stalk tissues. This is an air-borne disease; it is primarily transmitted through the air currents and secondary transmission is through the infected setts, irrigation water, splashed rains and soil. Trichoderma spp. and Chaetomium globosum have been frequently used for biocontrol of aerial pathogen. Microorganism selected for the management of pokkah boeng should be aggressive competitor, well adapted to the agro-ecosystem and may be easily applied under field conditions. The selected bioagent enhances or maintains already existing defense mechanisms operating in the environment. Inhibitory effect on the growth of F. moniliforme was studied with five biocontrol agents viz., Trichoderma harzianum, Trichoderma hamatum, Trichoderma viride, Aspergillus flavus and Aspergillus niger. Soil application with bioagents enriched farmyard manure (FYM) in different plots was done before sowing. The data revealed that all the bioagents suppressed the colony growth of F. moniliforme. The suppression of the growth of the pathogen is significantly higher with T. viride and T. harzianum which were at par among themselves. The minimum inhibition was observed in T. hamatum, A. niger and A. flavus. The study also showed that soil application with Trichoderma-enriched FYM gives an additive effect in reducing the incidence of pokkah boeng disease of sugarcane in comparison to those of bioagents alone.

Keywords: *bioagents, Fusarium moniliforme, Pokkah boeng, sugarcane, biotic and abiotic, Trichoderma*

****Author for Correspondence*** E-mail: debjani.21697@lpu.co.in

INTRODUCTION

Sugarcane (*Saccharum* spp.) is an economically important cash crop of many tropical and subtropical countries that is used to produce sugar and biofuels [1]. It is the world's largest sugar-producing crop and leads second in production quantity in India [2]. The crop is affected by many biotic and abiotic stresses challenging the sugar production in India. Among the biotic stresses and diseases such as red rot, wilt, grassy shoot, pineapple disease, smut, leaf scald and pokkah boeng have been considered as serious constraints. Among the foliar diseases, pokkah boeng was recorded to range from 1% to 90% during 2007–2017 in the most affected cultivars leading to serious threats for commercial sugar production in U.P. Although the disease has been a minor problem, the epidemiological threats during last few years indicated the growing concern for this disease [3]. Nowadays, the incidence and severity of the disease has been reported from Uttar Pradesh, Maharashtra, Punjab, Haryana, Assam, Tamil Nadu and Bihar—the major sugarcane growing states in India and many other sugarcane-growing countries (Whittle and Irawan, 2000).

Pokkah boeng, derived from a Javanese term, describes a disease affecting the sugarcane tops. It was first recorded in Java by Walker and Went in 1886 and later reported by Edgerton and

 © STM Journals 2019. All Rights Reserved

Agrica
Vol. 10, Dec 2021 Page No. 100-110
DOI 10 5958 2394 448X 2021 00016 X

IndianJournals.com

Detection and Management Strategies of Guava Wilt Pathogen

Vinit Pratap Singh[1], D.K. Singh[1], Meenakshi Rana[2], Nawale Rutuja Yadaorao[2], Poonam P. Shete[2], Raghavendra Reddy Manda[3] and Seweta Srivastava[2*]

[1]College of Agriculture Campus, Azamgarh, Acharya Narendra Dev University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India
[2]School of Agriculture, Lovely Professional University, Phagwara - 144411, Punjab, India
[3]Wageningen University and Research, 6708 PB Wageningen, The Netherlands

*Corresponding author: seweta.21896@lpu.co.in

Received : 20 Nov. 2021 Accepted : 27 December 2021

www.IndianJournals.com
Members Copy, Not for Commercial Sale
Downloaded From IP - 103.57.187.179 on dated 8-Mar-2022

ABSTRACT

Guava (*Psidium guajava* Linn.) is a popular fruit crop grown commercially around the world. In India, it is grown almost in all the states. Guava wilt is extremely severe and soil borne disease, *i.e.*, difficult to control once the symptoms appear on the plant foliage. This disease can better be called as guava wilt complex because several pathogens viz., *Fusarium oxysporum* f. sp. *psidii*, *F. solani*, *F. proliferatum*, *F. chlamydosporum*, *Macrophomina phaseoli*, *Rhizoctonia bataticola*, *Cephalosporium* sp. *Gliocladium vermoesenii*, *G. roseum*, *Verticillium alba-atrum*, *Acremonium* sp. and *Nalanthamala psidii* are involved to cause guava wilt. Traditional culturing methods take a long time for identification of pathogenic isolates. A protocol has been developed for the detection of *Fusarium* from soil samples in the early stage of infection. The present chapter emphasize on various molecular detection techniques used to facilitate the rapid detection of pathogen from infected soil samples collected from rhizospheric zone of guava. The disease is soil-borne and is difficult to control. Numerous approaches are used to manage this disease which cause major financial loss have been proposed, including cultural, physical, biological and chemical treatment including host plant resistance. In this context, this chapter is also critically based on the different control measures of guava wilt that have been used in laboratory studies as well as in the guava fields.

Key words: Gauva, wilt, pathogen, detection, management

INTRODUCTION

Guava is grown in tropical and subtropical climates that are conducive to its development (Mohan *et al.* 2020). It is high in calcium, vitamin C, nicotinic acid, phosphorus, and soluble fibre, providing an important source of food for many less developed countries. Guava is thought to have originated in South America (Mexico to Peru) (Amusa *et al.* 2005). South Asian nations, the Hawaiian Islands, Cuba, Brazil, Pakistan, and India produce most of it (Almadhor *et al.* 2021).

Wilt disease is a major limiting factor for the productivity and production of guava (Pereira *et al.* 2017). Rhizosphere soils contain a wide variety of microbes *viz.*, fungi, viruses, nematodes and bacteria, etc. Different type of interaction may take place in the rhizosphere, which include effect of microflora on plant growth and different type of interactions like symbiosis, antagonism, synergism between the rhizosphere microfloras. Rhizosphere and rhizoplane microbial population can influence the various aspects of plant growth and development like root morphology, root to shoot weight ratio, physiological process and crop yield, etc (Hakim *et al.* 2021). Rhizosphere microorganisms, directly or indirectly effects the plant growth by making the nutrients available to the plants and by being antagonistic to phytopathogens. They

The Pharma Innovation Journal 2022; 11(5): 2509-2514

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(5): 2509-2514
© 2022 TPI
www.thepharmajournal.com
Received: 08-01-2022
Accepted: 16-04-2022

Prashant Singh
Department of Plant Pathology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, India

Ramji Singh
Department of Plant Pathology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, India

Madhu GS
ICAR-Indian Institute of Horticulture Research, Bengaluru, Karnataka, India

Vinit Pratap Singh
Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Madhu GS
ICAR-Indian Institute of Horticulture Research, Bengaluru, Karnataka, India

Standardization of optimal moisture level on population density, longevity and multiplication of drought tolerant *T. harzianum* isolates on de-oiled cake of Neem

Prashant Singh, Ramji Singh, Madhu GS and Vinit Pratap Singh

Abstract
Trichoderma species naturally occurring antagonistic microorganisms has performed great potential to antagonize plant pathogens. Hence, biocontrol involving the use of such beneficial microorganisms for plant protection is being considered as a viable substitute to reduce the use of chemical pesticides. These microorganisms need to be multiplied and kept viable often for long period under storage. This study aim to study multiplication and longitivity of *Trichoderma* isolates on de-oiled neem cake at different moisture regimes. Fifteen isolates of *Trichoderma* were isolated in different region of Utter Pradesh state of India and one isolate IRRI 1 was collected from Internation Rice Research Institute. Neem cake was able to support the highest population dynamics of *T. harzianum* strains at 70 per cent moisture level up to 21 days. Increasing the moisture beyond 70 per cent resulted in declining the population dynamics of *T. harzianum*. These findings suggested that 70 per cent additional moisture in the de-oiled cake of Neem is most appropriate for increasing the population dynamics of *T. harzianum* strains. *T. harzianum* strains *i.e.* IRRI-1, TH-28, TH-26, TH-21, TH-30, TH-3, TH-29 and TH-7 were found to be best performer with regard to their rate of multiplication. Even without additional moisture, the two strains *i.e.* IRRI-1 and TH-28, could sustain their viability at the cake.

Keywords: *Trichoderma harzianum*, cake, neem, strains

Introduction
Trichoderma species are effective antagonists with biocontrol abilities against economically significant plant parasitic soil-borne infections and are found in nearly all soil types (Shahid *et al.*, 2014) [6]. It's a free-living fungus found in soil and root ecosystems, and it's extremely interacting in root, soil, and foliar environments. It inhibits pathogen growth, survival, and infections through a variety of methods including antibiosis, mycoparasitism, hyphal contacts, enzyme release, induced host cell resistance, and nutrition and space competition. (Yedidia *et al.*, 2003) [7]. Trichoderma spp. are not only effective pathogen antagonists, but they also promote plant growth and root development by colonizing roots as endophyte symbionts, solubilizing minerals and increasing the availability of insoluble nutrients, secreting siderophores, plant growth regulatory materials (phytohormons), vitamins, and enzymes, and so on (Harman *et al.*, 2006) [8]. Trichoderma penetrates the epidermis to colonise root surfaces in a robust and long-lasting manner, increasing plant drought tolerance. Drought avoidance through morphological adaptations, drought tolerance through physiological and biochemical adaptations, and accelerated drought recovery are some of the mechanisms involved in Trichoderma's modulation of drought response (Malinowski *et al.*, 2000) [5].
Several microorganisms have been floated in the market as biocontrol agents (formulations) over the last few decades, and many low-cost materials have been used as carriers, but the problem is that they do not perform as well in the field as they do in lab and glasshouse experiments, and appear to be less effective. They also have limitations in terms of viability and population reduction during storage and transportation. As a result, there is a demand for low-cost materials that are nutrient-rich, biodegradable, and compatible with other ingredients along with biocontrol agents support. These materials can be used as substrates for mass multiplication and help to sustain the viability and survival of BCAs for longer periods of time during storage and transit. They can also supply nutrition if applied to soil (field & pots) conditions.

References

- Murugesan.P. 1996. Impact of training on Mushroom Cultivation- an Analysis, Unpub. M.Sc (Ag.)Thesis, AC & RI, TNAU, Coimbatore.
- Anandan, T. and J. Vasantha Kumar.1999. Groundnut Growers preference for training Journal of Extension Review.
- Ansari, M., Rand, D. M. and Chanderi. 2000.Effectiveness of induction training Program organized for Assistant Agricultural officer. *Journal of Extension Education.*1(1)
- Narendra Prakash and Ram Bahal 2001. Constraints in adoption of recommendation of ICAR research in North hilly regions. *Journal of Extension Education* 12(1):3056-3057pp.
- Cha J.S. 2004. Pest disease and management Mushroom Grower hand book volume1. Mushroom world July 2004.

007 Mushroom: improving human health and Immunobusting agent during Covid-19

*VINIT PRATAP SINGH[1], PRASHANT SINGH[2] and SHWETA SRIVASTAVA[3]

[1]*College of Agriculture Campus, Azamgarh, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India*

[2]*Department of Plant Protection, Gorakhpur, Uttar Pradesh, India*

[3]*School of Agriculture, Lovely Professional University, Phagwara, Punjab, India*

**Email: vinitpratapsingh15@gmail.com*

The world Health Organization (WHO) has declared the corona virus disease 2019 (COVID-19) a pandemic disease. Although the virus can infect people of all ages, evidence suggested that older people (those of 60 years old), pregnant women and small children have more probability of disease occurrence. This may be due to age which is associated with a decline in immunity, higher risk of co-morbidities like Diabetes, Heart disease, Lung conditions, Cancer and people with disability may be a greater risk of contacting COVID-19. In India the situation is getting severe day by day. Here people facing the problem of poverty, malnutrition, unemployment and this pandemic disease make the situation more burst. So it is necessary that we must have to protect ourselves from the COVID-19 which can be fulfilled by improving the immunity level of our body. We know that India is an agricultural country. Most of the people depend on agriculture for its livelihood. There are many agricultural products which can help us to build up strong immunity system out of them one important product is mushroom. Mushroom cultivation can convert the huge lignocellulosic waste materials into a wide diversity of products (edible or medicinal food, feed and fertilizers), protecting and regenerating the environment. Cultivated edible mushrooms are the fruiting bodies of basidiomycetes with a saprobic life style. These basidiomycetes can be divided into primary, secondary, and tertiary decomposers (1). Primary decomposers such as the oyster mushrooms (*Pleurotus* spp.) and shiitake (*Lentinula edodes*) degrade hemi-cellulose, lignin, and other components of plant material. Unlike secondary and tertiary decomposers, they do not depend on other organisms and their metabolites. Secondary decomposers such as the button mushroom typically colonize composted materials, while tertiary decomposers such as

European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 07, Issue 07, 2020

Fusaric Acid: A Potent Vivotoxin

Seweta Srivastava, Vinit Pratap Singh, Meenakshi Rana

[1]School of Agriculture, Lovely Professional University, Phagwara, Punjab, India
[2]College of Agriculture Campus, Azamgarh, ANDUA&T, Ayodhya, Uttar Pradesh, India

Email: meenakshi.20557@lpu.co.in

Abstract: ***Vivotoxin designates a secondary metabolite produced by the pathogen and/or its host during infection, produces disease symptoms, but is not oneself the initiating causal agent of the infection. Out of all, Fusaric-acid is the most studied pathogen produced wilt toxin classified as a non-specific vivotoxin. It does not produce all the symptoms of wilt. Many scientists all over the world including India were of the belief that, out of all other toxins involved in the infection process of wilting, fusaric acid was the most potent one. Infected tissue shows a marked increase in respiration process which is contrary to the host tissues doped with fusaric acid because it is a best-known respiratory depressant.***

Key words: ***Fusaric-acid, Fusarium oxysporum, Potent, Vivotoxin, Wilting***

1. INTRODUCTION

Dimond and Waggoner, 1953 gave the term "vivotoxin" to denominate "a substance produced in the infected host by the pathogen and/or its host, which functions in the production of disease, but is not itself the initial inciting agent of disease." They also notified that "a vivotoxin is a disease-producing entity and therefore a pathogenic agent." They enlisted 3 major criteria as the nominal need to set up vivotoxicity. These were -
(a) reproducible segregation from the infected host plant,
(b) purification, and
(c) re-production of at least a fraction of the disease symptoms by allocating the toxin in a same healthy plant.

Dimond, 1955 subsequently altered their criteria by defining that vivotoxin "not be present in the healthy host" because it produces during the host-pathogen interaction. Dimond as well explained that, instead of refinement, the toxin be defined chemically. Dimond & Waggoner seemed to be cognizant of this in consideration that vivotoxicity could be incontestable by observing only the 1st and 3rd of their criteria. Paradoxically, they said that "just as it is usually necessary to know the identity of a parasite to establish it as a cause of disease, so it is also necessary to purify and identify a vivotoxin to prove its complicity." We disagree with the postulate expressed in the first section or with the assumption attained in the last. What is required in both the cases is indicated in the conclusion that the parasite or the toxin perform a significant causative function during the occurrence of biotic infection. Here we want simply signalize that criteria which stipulate the requisite evidence are more adequate than those which prescript the processes by which the information is to be received. First step of Dimond & Waggoner's, which shows segregation of the toxin from the infected host plant, is based on the aforementioned criticism. Separation of most potent, coseismal toxin, existing in little bulk, seems impracticable, but tolerable illustration is that it utilizes in the creation of infection symptoms may be acquired by some different ways (Braun and Pringle, 1959). Despite the fact that these considerations betoken that the criteria of Dimond & Waggoner are little idealistic because they don't explain straight on the query of their

Journal of Pharmacognosy and Phytochemistry 2017; 6(5): 1488-1492

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

SSN: 2278-4136
SSN: 2349-8234
2017; 6(5): 1488-1492
eived: 03-07-2017
epted: 04-08-2017

tika Singh
artment of Genetics and
t Breeding, Narendra Deva
versity of Agriculture and
hnology, Narendra Nagar
marganj), Faizabad (U.P.),
ia

Vimal
artment of Genetics and
t Breeding, Narendra Deva
versity of Agriculture and
hnology, Narendra Nagar
marganj), Faizabad (U.P.),
ia

Prakash Shrivastav
artment of Genetics and
t Breeding, Narendra Deva
versity of Agriculture and
hnology, Narendra Nagar
marganj), Faizabad (U.P.),
ia

ndra Maurya
artment of Genetics and
t Breeding, Narendra Deva
versity of Agriculture and
hnology, Narendra Nagar
marganj), Faizabad (U.P.),
ia

i Singh
. P. G. College Jaunpur
.), India

espondence
Prakash Shrivastav
artment of Genetics and
t Breeding, Narendra Deva
versity of Agriculture and
hnology, Narendra Nagar
marganj), Faizabad (U.P.),
a

Character association and path analysis of yield contributing traits and quality parameter in chickpea (*Cicer arietinum* L.)

Vartika Singh, SC Vimal, Shiv Prakash Shrivastav, Virendra Maurya and Nidhi Singh

Abstract

Forty genotypes along with three check varieties of chickpea (*Cicer arietinum* L.) were assessed to work out the association of different seed yield traits, direct and indirect effects of their various attributes on seed yield. Seed yield per plant showed significant and positive correlation with pods per plant, seed yield per plant showed highly significant and negative correlation with days to 50% flowering and non-significant correlation with other characters. The characters showing significant positive correlation among yield and important characters would be highly effective and efficient in improving respective traits. Path analysis identified pods per plant and seedling length as important components having high order of direct effect to secondary branches per plant and vigour index as important components having high order of indirect effect on seed yield per plant. The characters identified above as important direct and indirect yield components merit due consideration in formulating selection strategy in chickpea for selection of high yielding varieties.

Keywords: Chickpea (*Cicer arietinum* L.), Character association, Path analysis, Seed yield, Quality parameters

Introduction

Chickpea is an important pulse crop in India. It is grown in *Rabi* season in India. Globally, the pulses are the second most important group of crops. These are used for food for human and other animals. Pulses are an important food crop due to their high protein and essential amino acid (methionin, cystein and trypltophan) required for the proper growth and development of human body. On an average pulse contain 20-25 *per cent* protein and dry seed. Chickpea (*Cicer arietinum* L.) belongs to genus *Cicer*, tribe Cicereae, family Fabaceae, and subfamily Papilionaceae. It originated in south-eastern Turkey. The *Cicer* is of Latin origin, derived from the greek word 'kikus' meaning force or strength. Among pulse, chickpea occupies a premier position in respect of area and production in the world. It is grown in an area 13.20 m ha and the production is around 11.60 m tonnes with an average productivity of 880 kg per ha. India is also greater consumer as well as importer of chickpea in the world. In India, chickpea is grown about 9.93 m ha area and producing 9.53 m tonnes grain with productivity of 960 kg per ha. In Utter Pradesh, it is cultivated on area of 577 thousand ha with grain yield production is 475 thousand tonnes and productivity of wheat crops is 824 kg per ha respectively 2013-14 (Anonymous, 2015) [1]. It is cultivated throughout the country excepting high altitude and costal region. However, the major chickpea producing state are Madhya Pradesh, Rajasthan, Maharashtra, Karnataka and Andhra Pradesh. Which contribute more than 90 per cent of the national production.

At germination levels it not only involves speed and totality germination but also punching power of the seedling at different range of environmental condition. Thus study of correlation and direct and indirect effects of seed traits provides the basis for successful plant. The objective of this study was to determine the correlation and path analysis of yield and yield contributing characters in chickpea to assess their suitability in a breeding plant.

Materials and Methods

The study was designed to work out the status of association of different seed yield traits and direct and indirect effects of these different traits on seed yield per plant among forty chickpea genotypes at field experiment under present investigation was conducted during *Rabi* 2014-15 at the Student's Instructional Farm and lab experiments were conducted in Seed Testing Laboratory, Seed Technology Section, N. D. University of Agriculture and Technology,

Scanned by CamScanner

Journal of Pharmacognosy and Phytochemistry 2017; 6(5): 22-26

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

i: 2278-4136
i: 2349-8234
017; 6(5): 22-26
ed: 15-07-2017
ed: 16-08-2017

Kumar
ment of Genetics and
Breeding (Seed Technology
) N. D. University of
lture and Technology,
rganj-224 229, Faizabad
India

al
ment of Genetics and
Breeding (Seed Technology
) N. D. University of
lture and Technology,
rganj-224 229, Faizabad
India

a
ment of Genetics and
Breeding (Seed Technology
) N. D. University of
lture and Technology,
rganj-224 229, Faizabad
India

kash Gupta
ment of Genetics and
Breeding (Seed Technology
) N. D. University of
lture and Technology,
rganj-224 229, Faizabad
India

ondence
Kumar
ment of Genetics and
reeding (Seed Technology
) N. D. University of
ture and Technology,
ganj-224 229, Faizabad
ndia

Enhancement of yield components and seed quality parameters by growth regulators in lentil (*Lens culinaris* Medik.)

Pankaj Kumar, SC Vimal, Sarvjeet and Jai Prakash Gupta

Abstract

The present study were carried out in the Department of Genetics and Plant Breeding, N. D. University of Agriculture and Technology, Kumarganj Faizabad during *rabi* season 2015-16 and 2016-17 entitled "Enhancement of yield components and seed quality parameters by growth regulators in lentil (*Lens culinaris* Medik.)" The objective of the study was To standardize growth regulators optimization seed germination and vigour potential, with the selection of GA_3, Kinetin and NAA for exploitation of its, maximum grain yield in lentil under the agro-climatic conditions. The 19 treatments of growth regulators and seed priming for lentil variety (NDL-1) was evaluated following 13 quantitative characters *viz.*, Days to 50% flowering, Days to maturity, plant height on 30 and 60 days, number of branch on 30 and 60 days number of pods per plant, number of seeds per pod, 1000 seed weight biological yield/plant harvest index (%), seed yield per plant (g), seed germination, seedling length vigour index. The treatment T_3 (GA_3 150 ppm (priming) was found best in, all the treatments. Maximum number of pods per plant (46.69) and seed yield/plant (2.68 g) was recorded with T_3 (GA_3 150 ppm (seed priming).

Keywords: lentil, growth regulator, Priming

1. Introduction

Pulses are the cheapest and most widely consumed source of protein in countries like India, having predominantly vegetarian population. On an average pulse contain around 20-25% protein, which is 2.5 to 3.0 times higher than that of cereals and are correctly called as "poor man's meat". Besides protein, pulses are also rich source of calories, vitamins and minerals essential for human nutrition.

Lentil (*Lens culinaris* Medik) is one of the most nutritious amongst cool season legumes, and belonging to family, *leguminoseae* and sub-family- *papilionaceae*, genus- Lens and species- culinaris with chromosome number 2n = 14. It is of very ancient origin and its native home is regarded to be the countries in eastern Mediterranean littoral, such as Asia Minor, Greece and Egypt, from where it extended eastwards to India. The valleys in the Hindukusk Mountains in India are also claimed as its native regions. It was later introduced in Europe, Africa and America. It is known by at least 30 common names in various parts of the world *viz.*, Masoor, Mangu/ Margu, Masura, Renuka, Mangalaya *etc.*

Seed priming is a pre-sowing treatment which involves a controlled hydration of seeds, sufficient to allow pre-germinative metabolic events to take place while insufficient to allow radicle protrusion through the seed coat. This technique has been used to increase yield components and seed quality parameters under unfavorable environmental conditions Treatments were various doses of growth regulators alone and along with foliar spray of growth regulators. Besides, seed priming technique is used for lentil production in some area. Priming can enhance crop establishment, vegetative growth and seed yield of lentil. The factor attributed for low yield of pulses in India as compared to the world productivity are non-availability of quality seeds of improved and short duration varieties, growing of pulses under marginal and less fertile soil with low input and pest and disease management growing of pulses.

Materials and Methods

The field experiments under present investigation were conducted during 2015-16 and 2016-17 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U. P.). Geographically, Narendra Nagar situated between 26.47^0 N latitude, 82.12^0 longitude and at an altitude of 113 meters above the mean sea level. The climate of district Faizabad is semi-arid with hot summer and cold winter.

Scanned by CamScanner

Journal of Pharmacognosy and Phytochemistry 2017; 6(3): 835-840

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

4136
8234
): 835-840
03-2017
04-2017

f Genetics and
g. (Seed Tech.
AT, Kumarganj,
ar Pradesh, India

f Genetics and
g. (Seed Tech.
AT, Kumarganj,
ar Pradesh, India

upta
f Genetics and
g. (Seed Tech.
AT, Kumarganj,
ar Pradesh, India

f Genetics and
g. (Seed Tech.
AT, Kumarganj,
ar Pradesh, India

Genetics and
(Seed Tech.
T, Kumarganj,
Pradesh, India

Determination of best combination of bio-fortification and hydro-priming for yield and its quality parameters in chickpea (*Cicer arietinum* L.)

Sarvjeet, SC Vimal, Jai Prakash Gupta and Ashish Singh

Abstract
The field experiments under present investigation were conducted during *Rabi* 2014-15 and 2015-16 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) with objective of to determine best combination of biofortification and hydropriming for yield contributing traits and seed quality parameters *i.e.* days to 50% flowering, Days to maturity, Plant height (cm) 30 and 60 DAS, No. of branches per plant 30 and 60 DAS, number of pod/plant, number of seed/pod, Biological Yield (g), harvest index, 100 seed weight (g), seed yield kg/ha, germination (%), seedling length (cm), vigour index, seed yield/plant (g). The experiments were conducted in factorial RBD design with three levels of biofertlizer (*Rhizobium* 7.5g, 10g, 12.5g, *Trichoderma* 5g, 7.5g, 10g and PSB 7.5g, 10g, 12.5g) and seed priming (13, 16, 18 hrs) in chickpea variety (Pant G-186), result revealed that inoculation of biofertilizers significantly improved plant height at 30 and 60 days, number of branches per plant on 30 and 60 days, number of pods per plant, number of seeds per pod, biological yield, harvest index, 100-seed weight, seed yield, seed germination, seedling length, vigour index and seed yield per plant. Overall the treatment of *Rhizobium* dose 12.5g with 16 hrs hydropriming produced higher seed yield (2170.08 Kg) in first year and (2083.17 Kg) in second year, respectively. On the basis of present study it was concluded that nodulation and seed yield of chickpea can be improved by inoculation with *Rhizobium* and hydropriming 16 hrs which could be economically feasible to increase chickpea production.

Keywords: bio-fortification, hydro-priming, *Cicer arietinum*

Introduction
Chickpea (*Cicer arietinum* L.) belongs to genus-*Cicer*, family-*Leguminosae or Fabaceae*, and sub family-*Papilionaceae*. It's origin is considered in South Eastern Turkey (Ladizinsky, 1975). In India, total production of chickpea was 9.53 million tones from of 9.93 million ha area with average yield of 960 kg/ha in year 2013-14. In area, production and productivity of Uttar Pradesh possessed 577 thousand ha. 475.4 thousand tones, 824 kg ha^{-1} respectively in year 2013-14 (Anonymous, 2015). Seed priming, several processes including storage, material handling, activation and synthesis of a number of enzymes and nucleic acids, repair and build up, Several biochemical and physiological changes have been observed in seeds during ageing membrane disruption is one of the main reason of seed deterioration the major cause of membrane disruption are increase in free fatty acid level and free radical productivity by lipid peroxydation. Different techniques could be used to enhance crop yield. Priming is also thought to increase free radical scavenging enzymes activity and counteract the effect of lipid peroxidation and reduce leakage of metabolites. The early improvements may increase the rate of unifofmity of seed germination and seedling emergence. (Afzal *et al.*, 2013) [1]
The present experiment entitled Determination of best combination of biofortification and hydropriming for yield and its quality parameters in chickpea (*Cicer arietinum* L.)

Materials and Methods
The field experiments under present investigation were conducted during *Rabi* 2014-15 and 2015-16 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U. P.). Geographically, Narendra Nagar situated between 26.47^0 N latitude, 82.12^0 longitude and at an altitude of 113 meters above the mean sea level. The chickpea crop was sown in the field using randomized block design (Factorial) with eight treatments and three replications. The treatment details are presented in Table 1.

Scanned by CamScanner

Int.J.Curr.Microbiol.App.Sci (2017) *6*(11): 1327-1334

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 11 (2017) pp. 1327-1334**
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.611.159

Effect of Plant Growth Regulators on Partially Aged Seeds of Spinach (*Spinacea oleracea* L.) Genotypes

Satya Prakash[1*], Poonam Singh[4], Kunwar A.P. Singh[2], Vipul Singh[3], Raghvendra Singh[3], S.C. Vimal[1] and Sagar Kumar Sharma[4]

[1]Department of Seed Science and Technology, [2]Department of Horticulture,
[3]Department of Agronomy, N. D. U. A. & T., Faizabad, India
[4]Department of Seed Science and Technology, C. S. A. U. A. & T., Kanpur, India
**Corresponding author*

Keywords

Spinach, Seed parameters, Plant growth regulators.

Article Info

Accepted:
12 September 2017
Available Online:
10 November 2017

ABSTRACT

Spinach is a good source of vitamins riboflavin and calcium and dietary fiber. Now a day plant growth regulators are playing a very important role in increasing yield, growth and improving the quality of crops. The experiment comprised seed treatments of plant growth regulators *viz.,* Gibberllic Acid (GA_3), Indole Acetic Acide (IAA), 2,3,5 Trido Benzoic Acid (TIBA) the observations were recorded on characters *viz.,* germination (%), abnormal seedling (%), shoot length (cm), root length (cm), seedling length (cm), seedling dry weight (g) and seedling vigour index-I. The study revealed that the different PGRs effects significant for all parameters. The application growth regulators GA_3 @ 50 ppm improved root length (7.37 cm), shoot length (7.91 cm), seedling length (15.28 cm) and seedling vigour index -1(976.81). While, the application of GA_3 @ 100 ppm recorded maximum germination (64.72 %) and dry weight (0.570 g). Among varieties, variety Allgreen was found superior for improved root length, shoot length, seedling length and seedling vigour index -1. It may be concluded that germination, seedling growth and vigour of partially aged seed of spinach can be significantly improve with the Application of GA_3 @ 50 ppm on variety Allgreen.

Introduction

Spinach (*Spinacia oleracea*) is an edible flowering plant in the family Amaranthaceae. It is native to central and south western Asia. It is an annual plant (rarely biennial) which grows to a height upto 30 cm. Spinach may survive over winter in temperate regions. The leaves are alternate, simple with ovate to triangular, variable in size from about 2-30cm long and 1-15cm broad with larger leaves at the base of the plant and smaller leaves higher on the flowering stem. The flowers are inconspicuous, yellow –green, 3-4 mm diameter, maturing into a small, hard, dry, lumpy fruit cluster of 5-10 mm across containing several seeds. Common spinach / palak were long considered to be in the family chenopodiaceae, but in 2003, that family was merged into the family amaranthaceae in the order caryophyllales. Within the family amaranthaceae, amaranthoideae and chenopodioideae are now subfamilies for the amaranths and the chenopods, respectively.

Spinach is thought to have originated in ancient Persia (modern Iran and neighboring

Scanned by CamScanner

Int.J.Curr.Microbiol.App.Sci (2017) 6(9): 665-679

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 9 (2017) pp. 665-679
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.608.082

Standardization of Hydropriming Duration for Enhance Seed Yield and its Quality Parameters in Chickpea (*Cicer arietinum* L.)

Sarvjeet*, S.C. Vimal and Pankaj Kumar

Department of Genetics and Plant Breeding, N. D. University of Agriculture and Technology, Kumarganj-224 229, Faizabad (U.P.), India
**Corresponding author*

ABSTRACT

The present study were carried out in the Department of Genetics and Plant Breeding, N. D. University of Agriculture and Technology, Kumarganj Faizabad during *Rabi* season 2014-15 and 2015-16 entitled "Standardization of hydropriming duration for enhance seed yield and its quality parameters in chickpea (*Cicer arietinum* L.)" The objective of the study was to standardize the hydro priming duration Seed priming is a simple and cheap method but is acceptable in different areas. In order to the effect of hydropriming treatment on germination percentage in caraway (Carum carviL.), this experiment was conducted by randomized block design (Factorial) design with three replications. The factor was including hydro priming 13(P_1), 16(P_2), and 18(P_3) hours. The results showed that the effect of hydropriming was significant on germination percentage, seedling length, and seedling vigour index. Mean comparison showed that the highest germination percentage, seedling length were achieved by P_2 and also the highest seedling dry weight and seedling vigour were achieved by P_2 and lowest germination percentage, seedling length, seedling dry weight and seedling vigour were achieved by P_1. The results of this experiment showed that hydro priming method can improve the germination percentage in field condition and lab condition.

Keywords

Chickpea, Bio-fertilizers, Priming.

Article Info

Accepted:
14 July 2017
Available Online:
10 September 2017

Introduction

Chickpea (*Cicer arietinum* L.) is the most important pulse crop in India with an average yield of 1500-2000 kg/ha. Chickpea is a diploid species with a chromosome number 2n = 16. It belongs to subfamily Papilionaceae of the family Leguminaceae. It's seeds contain 16.4-31.2% protein, 3.0% fibre, 38.1-73.3% carbohydrates, 1.6-9.0% cellulose, 0.2% Ca, 0.3% P, 3.0% ash, vitamins (C and B) and minerals (Mg, Zn, K, Fe) (Huda *et al.*, 2003 and Ozer *et al.*, 2010). Combined inoculation of *Rhizobium* with *Pseudomonas striata* or *Bacillus polymyxa* and with *Bacillus megaterium* have shown increased dry matter, grain yield and phosphorus uptake significantly over the uninoculated control in legumes (Elkoca *et al.*, 2008). Phosphate solubilising bacteria (PSB) plays an important role in making phosphorus available to crop plants.

The present study was undertaken comparative study of biofertilizers and seed priming on seed yield and quality of chickpea (*Cicer arietinum* L.). Seed priming, several processes including storage, material

Scanned by CamScanner

Int.J.Curr.Microbiol.App.Sci (2017) 6(9): 3260-3265

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 9 (2017) pp. 3260-3265
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.609.401

Study of Simple Correlation Coefficients for Yield and its Component Traits in Lentil (*Lens culinaris* Medik.)

Pankaj Kumar*, S.C. Vimal and Ajay Kumar

Department of Genetics and Plant Breeding, (Seed Technology Section), N.D. University of Agriculture and Technology, Kumarganj, Faizabad 224 229, Uttar Pradesh, India
**Corresponding author*

Keywords

Pulse, Lentil, Correlation coefficient.

Article Info

Accepted:
10 August 2017
Available Online:
10 September 2017

A B S T R A C T

An experiment was carried out during *Rabi,* 2015-17 at Students Instructional Form, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) to study the simple correlation coefficients among 13 quantitative characters with genotype NDL-1 in three replications using RBD Factorial design. Estimates of simple association coefficients among 13 quantitative characters estimated during 2015-16 and 2016-17 displayed that seed yield per plant exhibited highly positive significant associations with vigour index, biological yield per plant, seedling length, seed germination, harvest index, 1000 seed weight, number of seeds per pod, number of pods per plant, No. of branches/plant 60 days, No. of branches/plant 30 days, plant height (cm) 60 days, plant height (cm) 30 days, days to maturity and days to 50% flowering. All the other characters under study also displayed highly significant associations with each other besides seed yield per plant in both the years.

Introduction

The pulse is an annual leguminous crop yielding from one to twelve seeds of variable size, shape and color within a pod. Pulses are used for food for humans and other animals. Pulses are very important sources of protein in Indian diets as majority of population are vegetarian. Pulses are the third most important group of crops after cereals In the pulses includes; chickpea dry beans like pinto beans, kidney beans and navy beans; dry peas; and others among which lentil is a most important food legume. Lentil is eaten as *Dahl*, either whole or split. Lentil (*Lens culinaris* Medik) is of the important *Rabi* pulse, sown from October to December all over India either as a pure culture or as a mixture with sugarcane, linseed, rapeseed and mustard etc. The crop is harvested from February to April, depending upon the time of sowing. It can be grown on all kinds of soil. It can be successfully grown on poorer soil of moderate alkalinity. It can also tolerate drought. In the world India's rank 2nd in respect of production as well as acreages followed by Turkey. In India it is grown in about 1.48 m ha with total production 1.03 mt, and productivity 697 Kg/ha. Uttar Pradesh occupies 0.59 m ha area with 0.48 tones

Scanned by CamScanner

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-II) : 1447-1450 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

HETEROSIS AND INBREEDING DEPRESSION IN MUNGBEAN [*VIGNA RADIATA* (L.) WILCZEK] UNDER PROBLEMATIC SOIL

S.C. Vimal, Pankaj Kumar and K.K. Srivastava
Seed Technology Section, N.D. University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) India
E-mail: scvimalndgpb@gmail.com

ABSTRACT

Estimation of heterosis over better parent may be helpful in identifying real heterotic crosses, while their practical value may be known of through estimation of over the standard or the best variety of the area. The present investigation aims at estimating the magnitude of heterosis over better and standard parent and inbreeding depression for F_1 to F_2 were calculated in six set of crosses of mungbean in Khari and zaid seasons for seed yield and its related components. Marked hetrosis for seed yield and its important components were observed. The hybrid EC-393407× ML-550 be the most promising cross for seed yield and some other desirable traits. The study reveals good scope for commercial exploitation of heterosis as well isolation of pure lines among progenies of heterotic F_1 for improvement of yield level in mungbean.

Key words : *Mungbean, hetrosis, inbreeding depression, segregating generation, yield and yield components.*

Among the various pulses grown in our country, mungbean (*Vigna radiate*(L.)Wilczek) is one of the most important pulse Crops. Mungben also know as greengram, botanically belongs to family leguminosae and sub-family papillonaceae. It is a highly self-pollinated crop having somatic chromosome number (2n=2x) of 22. Mungbean is grown principally for its proteineous seeds that are used as human food. Prior knowledge of the nature of heterosis and inbreeding depression are paramount significance in crop improvement. Exploitation of heterosisis considered to be one of the outstanding achievements of plant breeding. In self-pollinated crops like mungbean, the scope for utilization of heterosis depends mainly upon the direction and magnitude of heterosis. In the present investigation the objective is to asses extent of hetrosis present in F_1 hybrid and to know the possibility of exploiting hetrosis in hybrid breeding programe. The estimates of hetrosis and inbreeding depression can gave a preliminary idea about the genetic control of particular character. It helps also in choosing suitable crosses to be used in combination breeding programmes.

MATERIALS AND METHODS

The experimental materials comprised of F_1, F_2, BC_1 and BC_2 generations of six crosses (EC-393410 X NDM-1, EC-393410 X Pant M-3, EC-393407 X ML-550, EC-393407 X NDM 5-3, NDM-1 X ML-287 and NDM 98-1 X NDM-1) along with eight homozygous and genetically diverse varieties/genotypes *i.e.* EC-393410, EC-393407, NDM-1, Pant M-3, ML-287, NDM5-3, ML-550 and NDM 98-1 and their subsequent crossed generations were grown in a Randomized Compact Family Block Design with three replications during *Kharif* and *Zaid* seasons at Genetics and Plant Breeding Research Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). At the time of raising the crop, the soil was partially reclaimed saline-sodic soil with pH=8.9-9.1 and EC= 4.0-4.6 mmhos/cm. All F_1 populations were planted in rows spaced 45 cm apart. Seed-to seed distance was kept approximately 10 cm. Fifteen competitive plants in non-segregating populations, 60 plants F_2 population and 45 plants in segregating population were selected for each entry to record observations on days to maturity, plant height, primary branches per plant, clusters per plant, pods per cluster, pod length, seed per pod, 100-seed weight, biological yield per pant, harvest-index and seed yield per plant. Heterosis and inbreeding for all the characters were estimated as usual.

RESULTS AND DISCUSSION

Highly significant and very high estimates of heterosis in positive direction over better-parent (Table 1) as well as standard parrent (Table 2) were exhibited by all the six crosses for seed yield for plant in *Kharif* and *Zaid* season. Heterobeltiosis for seed yield per plant ranged from 71.13% (cross V) to 178.01% (cross III) in *Kharif* season and from 60.09% (cross III) to 126.58% (cross VI) in *Zaid* season. Standard heterosis for seed yield varied from 82.10% in cross II to 248.90% in cross III in K*harif* season and from 52.32% in cross II to 157.14% in cross IV in *Zaid* season. Besides seed yield, very high heterobeltiosis and standard heterosis values of highly significant and positive nature were also recorded for pods per plant, followed by harvest-index and biological yield per plant in all the six crosses in both seasons expect highly significant and negative heterobeltiosis found in cross V for harvest-index in *Zaid* season. However, degree of both types of heterosis was comparatively lower for biological yield, in general, across the six crosses in both seasons. These six crosses also possessed high mean performance for seed

Scanned by CamScanner

, ISSUE SPECIAL(E) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

LATION AND PATH ANALYSIS OF SEED YIELD, ITS CONTRIBUTING TRAITS AND SEED QUALITY ETERS IN INDIAN MUSTARD [*Brassica juncea* (L.) Czern & Coss.]

S.C.Vimal, Nitin Kumar and Himanshu Singh
Department of Genetics and Plant Breeding
N.D.University of Agriculture & Technology, Kumarganj, Faizabad-224229 (U.P.) India

Abstract

riment on thirty genotypes along with three check varieties of Indian mustard was carried out during Rabi 2014-15 in Randomized sign with three Replications at Genetics and Plant Breeding Farm and Lab experiment was conducted in Seed Testing Laboratory &T, Kumargang, Faizabad (U.P.).The seed yield per plant exhibited significant and positive correlation with no. of silique on main lant height, no of primary branches per plant and seed germination. Existence of highly significant positive correlation amongst its important components. Path coefficient analysis identified highest positive direct effect on seed yield per plant was exhibited by ength followed by no. of seeds per siliqua and negative direct effect on vigour index followed by days to 50% flowering and days to

s: Indian mustard, Correlation Coefficient, Path analysis, Seed yield, Vigour index.

ustard (*Brassica juncea* L.) is one of the most important rops of India.Indian mustard or brown mustard (rai) was introduced from China into north-eastern India, from where ead to Afghanistan via Punjab, eastern Afghanistan, together ining north-western India. It is predominantly cultivated in , Uttar Pradesh, Haryana, Madhya Pradesh and Gujarat. Its is also being extended to non-traditional areas of southern *ssica* also performs well on neglected sites where problems acidity, low available nutrient content, poor drainage, nd soils with topographical limitations exist.

ny plant breeding programme is to develop high yielding vith better quality superior over existing one. The variability on of superior type can be obtained through screening and of germplasm. The knowledge of association between and their direct and indirect contribution towards of seed yield characters are additional help to plant deciding the selection criteria. Germplasm collections ie richest source of variability. Path analysis may be of lity to a plant breeder, but it definitely gives an insight into relationship among different characters in a biological d provides information whether the observed correlation is direct influence or through other variables. Thus, path ecifies the causes and also gives the relative importance of cters. Considering the above aspects, the present on was under taken to estimate correlation coefficients ious seed yield and yield contributing traits and to find out and indirect effect of seed yield with other quantitative and traits.

And Methods

nt investigation was designed to work out the status of of different yield traits and direct and indirect effects of rent traits on seed yield among the thirty Indian mustard at Field and Seed Testing Laboratory (STL) of Seed y Section, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India. The experiments were conducted in Randomized Block Design with three replications. The observations were recorded on eleven characters *viz.* days to 50% flowering, days to maturity, plant height, no. of primary branches per plant, no. of silique on main raceme, no. of seeds per siliqua, 1000-seeds weights, seed germination, seedling length, vigour index and seed yield per plant. Standard statistical techniques such as correlation between different characters Searle (1961) and Path coefficient analysis by Dewey and Lu (1959) in which seed yield was kept as dependant character. Germination test was conducted in three replications 100 seeds each by adopting Top on paper methods as described by ISTA procedures. The vigour index was calculated as per the method prescribe by Abdul-Baki and Anderson (1973) expressed in whole number.

Results And Discussion

The grain yield or economic yield in almost all the crops is a complex character, which manifests from multiplicative interaction of several characters that are termed as yield components. The genetic architecture of seed yield in Indian mustard as well as others crops is based on the balance or overall net effect produced by various yield components interactive with one another. Therefore, selection would not be better as such unless accompanied by the selection for various component characters responsible for conditioning it. Thus, identification of eleven yield components and information about their association with yield and with each other are very useful for developing effective breeding strategy for evolving high yielding varieties. The correlation coefficient measures the degree of symmetrical association between two variables or characters, which helps in understanding the nature and magnitude of association between yield and its component traits.

In the present study, correlation coefficients were computed among the 11 characters in Table-1. Seed yield per plant exhibited highly significant and positive

stimates of phenotypic and genotypic correlation coefficients among different characters in Indian mustard

racter	Days to maturity	Plant height (cm)	No. of primary branches/ plant	No. of siliqua on main raceme	No. of seeds/ siliqua	1000-seeds weight (g)	Germination (%)	Seedling length (cm)	Vigour index	Seed yield/ plant (g)
%	0.363*	-0.168	-0.016	-0.315	-0.004	-0.038	0.020	0.104	0.097	-0.214
	0.397	0.176	-0.032	-0.341	-0.011	-0.041	0.055	0.107	0.105	-0.229
		-0.359*	-0.258	-0.053	-0.082	-0.005	0.010	0.112	0.127	-0.271
		-0.377	-0.288	-0.053	-0.084	-0.006	0.005	0.118	0.131	-0.290
it			0.479**	0.035	0.015	0.198	0.561**	0.390*	0.436**	0.399*
			0.488	0.361	0.016	0.198	0.593	0.391	0.437	0.400
ary				0.031	-0.124	0.167	0.173	-0.049	-0.034	0.399*
lant				0.131	-0.128	0.170	0.191	-0.051	-0.034	0.407

Scanned by CamScanner

PlantArchives Vol. 18, Special Issue (ICAAAS-2018), 2018 pp. 242-246 *ISSN 0972-5210*

CHARACTER ASSOCIATION OF YIELD COMPONENTS AND SEED QUALITY PARAMETERS IN CHICKPEA (*CICERARIETINUM* L.)

Sarvjeet, S. C. Vimal and Jai Prakash Gupta

Department of Genetics and Plant Breeding, (Seed Tech. Section), NDUAT, Kumarganj, Faizabad (UP)

Abstract

An experiment was conducted to study the character association of yield components and seed quality parameters in chickpea *i.e.* days to 50% flowering, Days to maturity, Plant height (cm) 30 and 60 DAS, No. of branches per plant 30 and 60 DAS, number of pod per plant, number of seed per pod, biological Yield (g), harvest index, 100-seed weight (g), seed yield kg/ha, germination (%), seedling length (cm), vigour index, seed yield per plant (g). The experiments were conducted in factorial RBD design with three levels of biofertlizer (*Rhizobium* 7.5g, 10g, 12.5g, *Trichoderma* 5g, 7.5g, 10g and PSB 7.5g, 10g, 12.5g) and seed priming (13, 16, 18 hrs) in chickpea variety (Pant G-186). Association studies revealed that During 2014-15 seed yield per plant showed highly significant and positive correlation with number of branches per plant on 30 days (0.801), number of branches per plant on 60 days (0.645) number of pods per plant (0.508) while significant and positive correlation with the number of seeds/pod (0.479), seed yield kg/ha (0.416), plant height on 30 days (0.402). During 2015-16 seed yield per plant showed highly significant and positive correlation with harvest index (0.866), biological yield (g) (0.717), plant height on 30 days (0.652), number of branches per plant on 60 days (0.641), vigour index (0.629), seedling length (0.595) plant height on 60 days (0.552) while significant positive correlation with seed yield kg/ha (0.587).

Key words : *Cicerarietinum* L., Yield components, Seedling length, Plant height

Introduction

Chickpea (*Cicerarietinum* L.) is the most important ılse crop in India with an average yield of 1500-2000 /ha. The gram is mentioned in Sanskrit which indicates at it is cultivated in India since a longer period than in y other country in the World. Chickpea (*Cicerarietnium*) gram is an important *Rabi* season self pollinated gume crop having extensive geographical distribution. ıickpea is known by different names in various countries ch as Gram, Chana, Bengal gram etc. Chickpea is a ploid species with a chromosome number 2n = 16. It longs to sub family Papilionaceae of the family guminaceae

Investigations on characters association between rious agronomical and seed quality traits are important crop production, not only from theoretical consideration quantitative inheritance of the characters but also from ıctical view of point. Selection is usually conceded with ange in two or more characters simultaneously. This ormation may be used in the prediction of correlated ponse to directional selection in the construction of selection indices and in the detection of some characters which may have no value by themselves but are useful as indicators of the more important ones under consideration.

The correlation coefficients help us in understanding the relative importance of various yield influencing characters. So that the most important yield component can be identified. The identification of the few most important components is necessary for planning and execution of a successful crop production strategy because it is almost impossible and impractical to practice selection for large number of characters along with grain yield. Correlation coefficient analyses were carried out to determine the relative importance of consumer quality and seedling vigour traits related to seed yield in chickpea. Seed index was positively and significantly correlated with seed volume, seed density and volume expansion. Association of volume expansion was also positive and significant with seed volume, seed density and water absorption capacity. Germination relative index showed significant positive association with water absorption

Scanned by CamScanner

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 1883-1887

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

278-4136.
949-8234
7(2): 1883-1887
05-01-2018
06-02-2018

t of Genetics and
ding, N. D. University
ure and Technology,
j, Faizabad Uttar
dia

t of Genetics and
ding, N. D. University
ure and Technology,
, Faizabad Uttar
dia

nar
of Genetics and
ing, N. D. University
re and Technology,
Faizabad Uttar
lia

Genetics and
N. D. University
nd Technology,

Standardization of biofortification for enhance seed yield and its quality parameters in chickpea (*Cicer arietinum* L.)

Sarvjeet, SC Vimal and Anurag Kumar

Abstract

The objective of the study was to standardize the biofertilizer doses with the selection of Rhizobium strain for exploitation of its natural symbiosis with chickpea for effective nodulation, maximum grain yield in chickpea under the agro-climatic conditions. The 27 treatments of bio-fertilizers and seed priming for chickpea variety (Pant G-186) were evaluated following 12 quantitative characters *viz.* Days to 50% flowering, Days to maturity, plant height on 30 and 60 days, number of branches on 30 and 60 days number of pods per plant, number of seeds per pod, biological yield per plant harvest index (%), seed yield (kg/ha), 100 seed weight (g). The treatment P_2 T_{12} (*Rhizobium* 12.5 g) was found best in, all the treatments. Maximum number of pods per plant (75.38) and seed yield (Kg/ha) (2170.08) was recorded in Inoculation with Biofertilizer (*Rhizobium*).

Keywords: chickpea, bio-fertilizers, priming

Introduction

Pulses are the cheapest and most widely consumed source of protein in countries like India, having predominantly vegetarian population. On an average pulse contain around 20-25% protein, which is 2.5 to 3.0 times higher than that of cereals and are correctly called as "poor man's meat". Besides protein, pulses are also rich source of calories, vitamins and minerals essential for human nutrition. Among the various pulses grown in our country, chickpea (*Cicer arietinum* L.) is the most important pulse crop in India with an average yield of 2500-3000 Kg/ha. This crop is mentioned in Sanskrit which indicates that it is cultivated in India since a longer period than in any other country in the world. Gram is an important *Rabi* season self pollinated legume crop having extensive geographical distribution. Chickpea is known by different names in various countries such as Gram, Channa, Bengal gram *etc.* Chickpea (*Cicer arietinum* L.) crop is self-pollinated and diploid (2n=2x=16) species. It is belongs to genus *Cicer,* tribe Cicereae, family *Fabaceae*, and subfamily *Papilionaceae.* It originated in South-Eastern Turkey. The *Cicer* is of Latin origin, derived from the Greek word 'kikus' meaning force or strength. Similarly bio-fertilizers such as *Rhizobium* and Phosphorous Solubilizing Bacteria (PSB) also have beneficial influence on plant growth, seed yield and quality as they fix large quantity of biological nitrogen. The application of micronutrient and bio-fertilizers through seed treatment not only economies the cost of nutrients but also are readily available to the young seedlings for their vigorous growth and this initial early benefit would help to obtain higher seed yield and quality. However, studies on influence of seed treatments with micronutrients and bio-fertilizers on plant growth, seed yield and quality in chickpea (Ravindra *et al.*, 2007) [10].

Materials and Methods

The field experiments under present investigation were conducted during *Rabi* 2014-15 and 2015-16 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U. P.). Geographically, Narendra Nagar situated between 26.47° N latitude, 82.12° longitude and at an altitude of 113 meters above the mean sea level. The climate of district Faizabad is semi-arid with hot summer and cold winter. Nearly 80 per cent of total rain fall is received during the monsoon. The treatment details are presented in Table 1. Plant to plant distance and row to row distance was kept 10 and 30 cm, respectively. Fertilizer was applied @ 20:40:40 (kg ha $^{-1}$) N:P:K at the time of sowing. The chickpea crop was cultivated using standard agronomic practices. The observations were recorded at days to plant

Scanned by CamScanner

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

SN: 2278-4136
SN: 2349-8234
2018; 7(1): 1017-1025
ived: 04-11-2017
pted: 05-12-2017

rakash Gupta
Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
a

imal
l Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
a

Kumar
l Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
a

Kushwaha
l Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
ia

kaj Kumar
l Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
ia

espondence
Prakash Gupta
l Technology Section,
artment of Genetics and
t Breeding, NDUAT,
arganj, Faizabad, U. P.,
ia

Optimization of seed technological parameters and micronutrients supplementation on yield contributing characters, seed recovery and quality in rice (*Oryza sativa* L.)

Jai Prakash Gupta, SC Vimal, Ajay Kumar, GD Kushwaha and Pankaj Kumar

Abstract
The present investigation were conducted during *Kharif* 2015 and 2016 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India with objective of the study was to optimization of seed technological parameters and micronutrients supplementation on yield contributing characters, seed recovery and quality in rice (*Oryza sativa* L.) for yield contributing traits and seed quality parameters *i.e.* days to 50% flowering, no of tillers per plant, productive tillers per hill, Plant height (cm), panicle length, Days to maturity, spikelet fertility, harvest index, seed recovery, seed yield (q/ha), 1000 seed weight (g), germination (%), vigour index and electrical conductivity. The experiment was laid out in Split Plot Design with three replications keeping two methods of transplanting *viz.* C_1 (Normal method) and C_2 (SRI method) in the main plot and three foliar spray of micronutrient doses *viz.* M_1 (Zn, Fe and Mn @0.25%, 0.50%&0.25%), M_2 (Zn, Fe and Mn @0.50%, 1.00%&0.50%) and M_3 (Zn, Fe and Mn @0.75%, 1.50%&0.75%) in sub plot. The two transplanting spacing *viz.* S_1 (15×20 cm) and (25×25 cm) were also applied in the sub plots with three genotype *viz.* NDR 97, NDR359 and BPT 5204. The result revealed that inoculation of transplanting method, spacing and foliar spray of micronutrients doses significantly improved days to 50% flowering, no. of tillers per plant, productive tillers per hill, Plant height (cm), panicle length, Days to maturity, spikelet fertility, harvest index, seed recovery, seed yield (q/ha), 1000 seed weight (g), germination (%), vigour index and reduce electrical conductivity. Overall the treatment of findings revealed that rice crop should be transplanted on 25×25 cm under SRI method with the foliar spray application of Zn, Fe and Mn @0.75%, 1.50%&0.75%, for obtaining high seed yield potential of the variety producing good quality seeds.

Keywords: Micronutrients supplementation, Foliar spray, SRI method, Transplanting spacing, seed recovery, Rice seed.

1. Introduction
Rice (*Oryza sativa* L.) is a semi-aquatic annual grass plant belongs to the genus *Oryza*, tribe Oryzeae and family Poaceae. It is the second largest principal food crop in the world after wheat and is one of the main staple food crop in India. Besides being the staple food crop, it has been the cornerstone of food and culture for our people. Among seven billion people on the earth, more than half of them depend on this crop for principal source of energy in their daily diet. Rice is distributed over a wider range of latitude from 50 ^{0}N to 40 ^{0}S and is being grown up to an altitude of 2500 meters. It evolved in humid tropics as a semi aquatic plant and it has got unique adaptive nature to hot humid environment, which is not seen in any other major cereal crop.

Rice yield in India fluctuate greatly in time and space on account of its cultivation under diverse weather, ecological and socio-economic conditions. Out of the total 43.86 million ha. under rice, 20 million ha. area is irrigated and the remaining 23.86 million ha. area is cultivated in rainfed conditions. Rice can be grown under different agro-ecological environments.

Seed quality plays a crucial role in realizing the full genetic potential of varieties as well as benefits of other agricultural inputs (Seshu and Dadlani, 1993) [21]. The use of quality seeds alone increases the productivity to the extent of 15-20 per cent (Dahiya *et al.*, 1993) [7]. Only seeds with assured genetic and physical purity can be expected to response to the other inputs in agriculture. Among the inputs used by the farmers for agriculture production seed is the cheapest one and it forms only part of the cultivation expenses. All the efforts and investment would be unremunerative if farmer does not get good quality seeds. Only seed with good

Scanned by CamScanner

The Pharma Innovation Journal 2018; 7(3): 35-40
www.ThePharmaJournal.com
The Pharma Innovation

77- 7695
49-8242
g: 5.03
3): 35-40

rmajournal.com
-01-2018
-02-2018

Gupta
logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

ha
logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

a
logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

nce
Gupta
logy Section,
of Genetics and
ing, NDUAT,
Faizabad,
sh, India

To optimize doses of Zn, Fe and Mn in different combinations and its effect on yield contributing characters, seed recovery and quality in rice (*Oryza sativa* L.) varieties

Jai Prakash Gupta, SC Vimal, Ajay Kumar, GD Kushwaha and JP Srivastava

Abstract
The present investigation were conducted during *Kharif* 2015 and 2016 at Student Instructional Farm and lab experiments were carried out in Seed Testing Laboratory of Seed Technology Section, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India with objective of the study was to optimize doses of Zn, Fe and Mn in different combinations and its effect on yield contributing characters, seed recovery and quality in rice (*Oryza sativa* L.) varieties for yield contributing traits and seed quality parameters *i.e.* days to 50% flowering, no of tillers per plant, productive tillers per hill, Plant height (cm), panicle length, Days to maturity, spikelet fertility, harvest index, seed recovery, seed yield (q/ha), 1000 seed weight (g), germination (%), seedling vigour index and electrical conductivity. The experiment was laid out in the three foliar spray of micronutrient doses *viz.* M_1 (Zn, Fe and Mn @0.25%, 0.50% & 0.25%), M_2 (Zn, Fe and Mn @ 0.50%, 1.00% & 0.50%) and M_3 (Zn, Fe and Mn @0.75%, 1.50% & 0.75%) with three varieties *viz.* NDR 97, NDR359 and BPT 5204. The result revealed that inoculation of foliar spray of micronutrients doses significantly improved days to 50% flowering, no. of tillers per plant, productive tillers per hill, Plant height (cm), panicle length, Days to maturity, spikelet fertility, harvest index, seed recovery, seed yield (q/ha), 1000 seed weight (g), germination (%), vigour index and reduce electrical conductivity. Overall the treatment of findings revealed that among doses of foliar spray of micronutrient, Zn, Fe and Mn @ 0.75%, 1.50% & 0.75% may be utilized in rice for seed production as it produced higher seed yield, maintained the seed recovery and other yield contributing quality of seeds.

Keywords: Micronutrients supplementation, foliar spray, seed recovery, Rice seed

Introduction
Rice (*Oryza sativa* L.) is a semi-aquatic annual grass plant belongs to the genus *Oryza*, tribe Oryzeae and family Poaceae. It is the second largest principal food crop in the world after wheat and is one of the main staple food crop in India. Besides being the staple food crop, it has been the cornerstone of food and culture for our people. Among seven billion people on the earth, more than half of them depend on this crop for principal source of energy in their daily diet. Rice is distributed over a wider range of latitude from 50 ^{0}N to 40 ^{0}S and is being grown up to an altitude of 2500 meters. It evolved in humid tropics as a semi aquatic plant and it has got unique adaptive nature to hot humid environment, which is not seen in any other major cereal crop.

Rice yield in India fluctuate greatly in time and space on account of its cultivation under diverse weather, ecological and socio-economic conditions. Out of the total 43.86 million ha. under rice, 20 million ha. area is irrigated and the remaining 23.86 million ha. area is cultivated in rainfed conditions. Rice can be grown under different agro-ecological environments.

Seed quality plays a crucial role in realizing the full genetic potential of varieties as well as benefits of other agricultural inputs (Seshu and Dadlani, 1993) [11]. The use of quality seeds alone increases the productivity to the extent of 15-20 percent (Dahiya *et al.*, 1993) [15]. Only seeds with assured genetic and physical purity can be expected to response to the other inputs in agriculture. Among the inputs used by the farmers for agriculture production seed is the cheapest one and it forms only part of the cultivation expenses. All the efforts and investment would be unremunerative if farmer does not get good quality seeds.

Scanned by CamScanner

Chapter - 4

Doubling Farmer Income through Different Agriculture Sources

Shalini Srivastava, R.N. Kewat, S.C. Vimal and S.K. Chakravarti

Abstract

In agriculture, multiple cropping is the practice of growing two or more crops in the same piece of land in same growing seasons. It is a form of polyculture. It can take the form of double-cropping, in which a second crop is planted after the first has been harvested, or relay cropping, in which the second crop is started amidst the first crop before it has been harvested. Multiple cropping systems can help to get maximum production and ultimately maximum foreign exchange which is necessary for developing countries.

Keywords: Cropping system, season, marketing, income

Introduction

A related practice, companion planting, is sometimes used in gardening and intensive cultivation of vegetables and fruits. One example of multi-cropping is tomatoes + onions + marigold; the marigolds repel some tomato pests. Mixed cropping is found in many agricultural traditions. In the Garhwal Himalaya of India, a practice called baranaja involves sowing 12 or more crops on the same plot, including various types of beans, grains, and millets, and harvesting them at different times. In the cultivation of rice, multiple cropping requires effective irrigation, especially in areas with a dry season. Rain that falls during the wet season permits the cultivation of rice during that period, but during the other half of the year, water cannot be channeled into the rice fields without an irrigation system. The Green Revolution in Asia led to the development of high-yield varieties of rice, which required a substantially shorter growing season of 100 days, as opposed to traditional varieties, which needed 150 to 185 days. Due to this, multiple cropping became more prevalent in Asian countries.

Doubling Farming: The substantive points are: one, what is the period and targeted year for doubling the farm income; two, what is to be doubled,

Scanned by CamScanner

STUDIES OF GENETIC VARIABILITY, HERITABLE AND GENETIC ADVANCE *IN LINSEED (LINUM USITATISSIMUM L)*

Ram Jeet, R.K. Srivastava, S.C. Vimal, Vidya Sagar, Bitthal, S.P.Singh and Vinay Kumar
Krishi Vigyan Kendra Panti, Ambedkar Nagar, KVK, Barabanki and NDUAT Kumarganj, Ayodhya-224229 (UP)

Abstract

ıetic variability is basic requirement of crop improvement programme and effectiveness of selection depends upon its nature and magnitude vailable genetic material. In other words, genetic variability is fundamental to selection and to a great extent to the breeding methodology uch. The genetic variation is heritable one and hence, important in any selection programme. Heritability is one of the most important ct selection parameters which determine whether the phenotypic differences observed among the various individuals are due to differences heir genetic makeup or simply the results of environmental factors. Heritability is an index of transmissibility of traits from parents to r offspring's.Lush (1940) suggested the following uses of heritability estimates:When heritability in narrow sense is high, emphasis should olaced mainly on mass selection and if it is low, more pressure should be given on pedigree, sib tests and progeny tests. In case where stemic variance is relatively high emphasis should be placed on selection between families and line breeding.If over-dominance is strong, reeding programme is to be emphasized with an objective of commercial bybrid production. When the variance due to interaction between iotype and environment is relatively large, breeding programme should be stream lined on the development of superior varieties for ferent agro-climatic regions.Heritability in narrow sense could be utilized for estimation of expected improvement based on selection. iereas, the genetic advance in another parameter which helps breeders in estimation of he gain through selection pressure.Comstock and oinson (1952) defined that genetic advance as an improvement in the genotypic value in the new population as compared to the original : and depends upon the following three factors: The amount of genetic variability such as the magnitude of the differences among different ividuals in the base or initial population. The magnitude of the masking effects of the environmental and interaction components of iability on the genetic diversity.The intensity of selection which is being applied.

y words:-Line× tester, Genetic variability, heritability and genetic advance, linseed

roduction

the breading programme the Genetic variability heritability and ietic advance play the key role in the characterization of traffic. The icept of genetic variability heritability and genetic advance reported Gupta and Godwat (1981) studied 8 parents, 56 F_{2^s} and 28 F_{2^s} and orted high genetic coefficient of variation, heritability and genetic ance as percentage of the mean for 1000 seed weight, indicating t variation in due to additive gene effect. High heritability in jugation with low genetic advance as a percentage of the mean was ained for all characters except 1000 seed weight indicating the iation of these characters in due to non-additive gene effects. Patil l. (1981) reported high broad sense heritability estimates in two ieration for number of days to 50 per cent flowering, plant height, n number per plant, 1000-seed weight and seed yield per plant. ietic advance was highest for number of capsules per plant and d yield in both generation. Number of capsules pert plant and 1000- d weight were positively and significantly correlated with yield in h generations as reported by Kumar and Chauhan (1982) observed h narrow sense heritability for plant height and 1000-seed weight ile, moderate for seeds per capsule, tillers per plant and branches plant. They further reported substantial genetic gain for capsules plant, plant height and branches per plant, suggesting that these iracters are useful for selection if considered simultaneously. Rao l Singh (1984) studied the genotypic coefficient of variation broad ise heritability and genetic advance for seed yield per plant and the ld characters and reported that non-additive gene effects were portant for the most of the characters. Average broad sense itability value were moderate or high. For all traits (range 0.62- 8)indicating scope for improvement by breeding. Srivastava and gh (1984) reported high estimates of heritability for days to turity, plant height, number of primary and secondary branches per nt. Genetic gain was highest for plant height, secondary branches l capsules per plant.

terials and Methods

e present investigation was conducted at Main Experiment Station l Student's Instructional Farm of Narendra Deva University of riculture and Technology, Narendra Nagar Kumarganj, Faizabad .P.) during rabi 1999-2000 and 2000-2001. This place is graphically situated at 26.47^{0}E latitude, 82.12^{0}E longitude and at tude of 113 meters above the mean sea level. This area falls under nid subtropical zone which is characterized by hot and dry nmers with cold winters. The experimental material used in present investigation consisted of 44 Fis and 15 parental lines. These 44 F_{2^s} were developed by crossing 11 elite strains of diverse origin as lines (Females), with 4 released/widely adopted varieties as males, viz. Neelam, Garima, Subhra and Gaurav.Experimental material consisting of 59 treatments (44 F_{2^s} +15 parents) was sown in Randmozed Block Design with three replications. These entries were sown in single rows of three meter long with 30 cm row to row and 10 cm plant to plant spacing. All the recommended cultural practices were followed to raise a good crop.Observations on the following characteristics were recorded on five plants randomly selected and tagged from each row except the days to 50 per cent following and days to maturity, which were recorded on line basis. Plant height (cm), Days to maturity, Number of primary branches/plant, Number of secondary branches/plant, Number of capsules/capsule, 1000-Secd Height (g), Secd yield/plant (g).

Statistical analyses:-

The experimental data were compiled by taking the mean of sampled plants in a plot of each treatment in respect in respect of characters under study. Average of data were subjected to analysis of variance according to experimental design used. The data obtained from the set of 11 lines ×4 testers viz. Neelam, Garima, Subhra and Gaurav resulting (44 F_{1^s} and their 15 parents were used for combining ability analysis (Kempthorne, 1957) and estimation of hererosis (hayes et al 1955).

Coefficient of variability, heritability and genetic advance:-

The phenotypic, genotypic and environmental confidents of variability for all the nine characters has been given in Table 4.3. The magnitude of phenotypic coefficient of variability (PCV) was higher than the genotypic coefficient of variability (GCV) and environmental coefficient of variability (ECV) for all the characters under study. Higher estimates of PCV and GCV were prerecorded for number of capsules per plant, The character which exhibited moderate estimates (between) (12% to 18%) of PCV and GCV were number of primary branches per plant, 1000 seed weight and number of seeds per capsule. Remaining characters viz. plant height, days to 50 per cent flowering and days to maturity recorded low (<12%), estimates of PCV and GCV. Lowest value of ECV was recorded for days to maturity (0.98%) days to 50 per cent flowering (1.70%) and plant height (3.36%) High estimates of ECV were observed in primary branches per plant (10.90%) and seed yield per plant (7.99%).

Heritability in broad sense (h^2b), genetic advance (Ga) and genetic advance in per cent of mean (Gs%) were estimated for all characters

Scanned by CamScanner

COMBINING ABILITY STUDIES FOR CERTAIN QUANTITATIVE CHARACTERS IN LINSEED *LINUM USITATISSIUM L.**

Ram Jeet, S.C. Vimal, P.K. Singh, Vinay Kumar, Vidya Sagar, Shiv Nath & Pradeep Kumar
Krishi Vigyan Kendra Panti, Ambedkar Nagar U.P., N.D.U.A.T.Kumarganj, Ayodhya & C.S. Azad University Kanpur, U.P.

Abstract

mbining ability for 10 characters was studied using 7 lines viz. BAU-610A, EC-384154 JRF-3, JRF-4, Polf-34, H-25 and H-22 as females d 4 testers Padmini, Parvati, Shubhra and LCK-3003 as male crossed in line × tester mating design. Analysis of combining ability revealed existence of highly significant variation among crosses for all characters in F_1 and F_2 generations, respectively. The lines BAU-610A was nd to be good general combiner for days to maturity, plant height, number of primary branches/plant, 1000-seeds weight, seed yield/plant, content days to 50% flowering and incidence of Allternaria blight in F_1 generation. However, BAU-61A had significantly positive gca ect for days to 50% flowering and incidence of Alternaria blight and poor general combiner in Seed Yield/plant and oil content in F_2 nerations. The variance due to line × tester were significant for all the characters, suggesting the presence of non-additive gene effect for se traits. The crosses BAU 610-A× Shubhra, JRF-3x Padmini, JRF-4x Padmini in F_1 generation and EC-384154×Shubhra, JRF-Parvati in F_2 generation were to most promising for improvement of seed yield and one or more of its component traits.

ey words- Line × tester, gca, sca, linseed.

troduction

any breeding programme the appropriate selection of parents based their combining ability not only provides necessary information garding the choice of parents but also simultaneously illustrate the ture and magnitude of gene action involved. The line × tester ating design helps in realising the objective to estimate the mbining ability of parents and by their selecting superior parents as ell as cross combinations. Accordingly, the present investigation s undertaken to have the knowledge about the yield and other yield ributing characters of nature of combining ability for some newly veloped male and female lines of linseed (Linum usitatissium L.) d gene action for yield and other yield attributing characters.

aterials and Methods

e experimental materials used in present investigation consisted of crosses derived thought line × tester design were grown during bi 2004-05 for advancement of generation and promising 14 F_1s re back crossed to their respective parents for inheritance studies F_2 eds were also harvested. The experiment comprising of 67 notypes (28 F_1s+28 F_2s+11 parents) was conducted in a ndomized Block Design with three replications during rabi 2005- at Oilseeds Research Farm, Kalyanpur of chandra Shekar Azad niversity of Agriculture and Technology, Kanpur, These entries re sown in single row of three meter length with 30 cm row to row d 5 cm plant to plant spacing. The observations were were recorded 10 characters, namely, days to 50% flowering, days to maturity, ant height (cm), number of seeds per capsule, 1000-seeds weight, ed yield/pant, oil content and incidence of Alternaria blight.

mponents of variance estimates of phenotypic and genotypic efficient of variation (PCV and GCV) were evaluated by the rmula suggested by Burton (1952). Heritability in the broad sense s calculated following Hanson (1963). Whereas, expected genetic vance was estimated by the method suggested by Johnson et at 955).

esults and Discussion

e analysis of variance for combining ability in respect of 28 crosses r the 10 characters have been presented in Table-1. The variances ong the lines in respect of their general combining ability were ghly significant for all of the characters in F_1 and F_2 generations. e differences among the testers arising primarily due to their gca re highly significant for the characters in F_1 and F_2 expect days to aturity, number of seeds per capsule, 1000-seeds weight and cidence of Alternaria blight in F_2. The variances among the crosses e to line × tester interaction component indicating their sca, were ghly significant for all the characters in F_1 and F_2 except number of eds per capsule and 1000-seeds weight in F_2 and incidence of ternaria blight in both generations.

timates of gca effects showed that it was not possible to pick up a od general combiner for all characters because the combining ility effects of parents were not consistent for all the yield components. The lines BAU-610A was found to be good general combiner for days to maturity, plant height, number of primary branches/plant, number of capsules per plant, 1000-seeds weight, Seed yield/plant and oil content days to 50% flowering and least incidence of Alternaria blight in F_1 generation. However, BAU 610A had significantly positive gca effects for days of 50% flowering and incidence of Alternaria blight and poower general combiner in Seed yield/plant and oil content in F_2 generation. JRF-4 was found to be a good general combiner for plant height, oil content and more incidence of Alternaria blight in both F_1 and F_2 generations. H-25 and H-22 were identified as poor general combiner for days to 50% flowering and number of capsules per plant in F_1 and F_2 generations. The lines EC-384154 was a good general combiner for days to 50% flowering and days to maturity in respect of late maturity duration in both F_1 and F_2 generations. Among the testers Parvati proved to be a good general combiner for delayed maturity and tallness in bood F_1 and F_2 generations whereas, Padmini was best general combiner for earliness and dwarfness, seed yield, oil content and least incidence of Alternaria blight in F_1 generation Shubhra was identified as average general combiner for days to 50% flowering and number of primary branches/plant and number of capsules per plant in both F_1 and F_2 generations. H-22 was adjudged to be good general combiner for least incidence of Alternaria blight whereas, JRF-3 and LCK-3003 for Seed yield/plant in both F_1 and F_2 generations.

In the present investigation, the crosses exhibiting higher estimates of desirable sca effects common in both the generations were BAU 610A×Parvati for days to 50% flowering and EC-384154×Padmini for number of capsules per plant. These common crosses over the generations indicate additive ×additive type of gene action for the expression of concerned traits.

The cross combinations H-25×Parvati, BAU 610A×Padmini, H-25×Shubhra and EC-384154×Parvati, Polf-34×Padmini, JRF-4×LCK-3003 for days to maturity, JRF-4×Parvati, EC-384154×Parvati, BAU 610A×LCK-3003 and Polf-34×Parvati, H-25×Parvati, H-22×CK-3003 for plant height; Polf 34×Parvati, JRF-4×Padmini, BAU610A×LCK-3003 and EC-384154×Padmini for number of primary branches/plant; H-25×LCK-3003, EC384154×Padmini, BAU-610A×LCK-3003 and JRF-4×Parvati, EC-384154×Shubhara and H-22LCK-3003 for number of seeds per capsules; BAU610A×Shubhra, JRF-3×Padmini, H-22×Parvati and EC384154×Shubhra for 1000-seeds wight; BAU 610A×Shubhra, JRF-3×Padmini, JRF-4×Padmini and EC-384154×Shubhra, JRF-3×Parvati, H-25×Parvati for Seed yield/plant; Polf-34×Parvati H-22×LCK-3003, BAU 610 A×Shubhra and EC-384154×Padmini, JRF-3×Shubhra, Polf-34×LCK-3003, EC-384154×Padmini and H-22×Padmini, EC-384154×Padmini and H-22×Parvati, EC-384154×Shubhra for incidence of Alternaria blight were the good specific combinations for F_1 and F_2 generations, respectively.

Scanned by CamScanner

The Pharma Innovation Journal 2020; 9(9): 347-353

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(9): 347-353
© 2020 TPI
www.thepharmajournal.com
Received: 10-07-2020
Accepted: 12-08-2020

Suraj Kumar Hitaishi
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SC Vimal
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Amit Kumar Chaudhary
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Suraj Kumar Hitaishi
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Association and path analysis of yield attributes and physiological parameters in rice (*Oryza sativa* L.) under problematic soil conditions

Suraj Kumar Hitaishi, SC Vimal and Amit Kumar Chaudhary

Abstract
The present investigation were assessed to work out the association of different grain yield attributes and physiological parameters, direct and indirect effects of their various traits on grain yields. Observations were recorded for yield its contributing traits and physiological parameters. The grain yield having positive and strong correlation with chlorophyll content (0.871), harvest index (0.864), grains per panicle (0.632), spikelet per panicle (0.555), leaf temperature (0.553), and panicle length (0.513) and 1000-grain weight (0.493) showed positive and strong significant association with grain yield per plant at phenotypic level where as plant height and days to 50% flowering possessed significant negative correlation with grain yield per plant. Spikelet per panicle (0.580), biological yield per plant (0.570), harvest index (0.331), flag leaf area (0.164), protein content (0.142), days to maturity (0.129), chlorophyll content (0.107), spikelet fertility (0.098) and leaf temperature (0.045) exhibited direct effect on grain yield. Considering the correlation and path analysis flag leaf area, grains per panicle, 1000-grain weight and harvest index are important characters be considered for yield improvement.

Keywords: Rice, character association, path analysis, physiological parameters, grain yield

Introduction
Rice (*Oryza sativa* L.) is the most important staple food crop of the world because of being the major source of calories of more than half of the total global population. The importance of rice is not only as a fundamental commodity and primary food source for more than half of the world's population, but also influences issues of global concern such as food security and development. More than 90 per cent of the world's rice is grown and consumed in Asia, known as rice bowl of the world, where 60 per cent of the earth's people and two third of world's poor live. Rice being the staple food for more than 70 per cent of our national population and source of livelihood for 120450 million rural households is backbone to the Indian Agriculture.

Rice (*Oryza sativa* L.) is a semi-aquatic annual grass plant belongs to the genus *Oryza,* tribe Oryzeae and family Poaceae. It is the second largest principal food crop in the world after wheat and is one of the main staple food crop in India. Besides being the staple food crop, it has been the cornerstone of food and culture for our people. Among seven billion people on the earth, more than half of them depend on this crop for principal source of energy in their daily diet. Rice is distributed over a wider range of latitude from 50 0 N to 40 ° S and is being grown up to an altitude of 2500 meters. It evolved in humid tropics as a semi aquatic plant and it has got unique adaptive nature to hot humid environment, which is not seen in any other major cereal crop.

Rice yield in India fluctuate greatly in time and space on account of its cultivation under diverse weather, ecological and socio-economic conditions. Out of the total 43.86 million ha. Under rice, 20 million ha. Area is irrigated and the remaining 23.86 million ha. Area is cultivated in rainfed conditions. Rice can be grown under different agro-ecological environments.

Protein content of milled rice is 6-7 per cent, rice however, compares favorably with other cereals in amino acid content. The biological value of protein is high, the fat content of rice is low (2.0-2.5%) and much of the fat is lost during milling. Rice grain contains as much B group vitamin as wheat. Milled rice losses valuable proteins, vitamins and minerals in the milling process during which embryo and aleurone layer are removed and much of the loss of nutrients can avoided through parboiling process. The by-products of rice milling are used for a variety of purposes. Rice bran is used as cattle and poultry feed. Rice hull can be used in manufacture

Scanned by CamScanner

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(5): 1216-1218
Received: 28-06-2020
Accepted: 17-08-2020

Suraj Kumar Hitaishi
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

SC Vimal
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Amit Kumar Chaudhary
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Suraj Kumar Hitaishi
Department of Genetics and Plant Breeding, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Heterosis and inbreeding depression for yield, its contributing characters and physiological parameters in rice (*Oryza sativa* L.) under stress condition

Suraj Kumar Hitaishi, SC Vimal and Amit Kumar Chaudhary

Abstract
Heterosis and inbreeding depression studies in rice were carried out on seventeen characters against two crosses: Cross I (NDRK 5004 × NUD 3) and Cross II (PANT 10 X IR 28) at Student's Instructional Farm of Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya-224229 (U.P.), India. Heterosis of F1 hybrids over Standard parent and better parent varied from character to characters in the two crosses. Significant positive heterosis was observed for harvest index and grain yield per plant in both the crosses. Highest inbreeding depression was observed for grain yield per plant and lowest for biological yield per plant in Cross I. While highest inbreeding depression was observed for harvest index and lowest for leaf nitrogen in Cross II. Grain yield per plant in Cross I and spikelet per panicle in Cross II recorded high level of heterosis and inbreeding depression. Significance of dominance gene effects and epistatic interactions for most of the traits in six crosses indicated that exploitation of heterosis through hybrid varieties appears to be a potential alternative. The positive and significant heterobeltiosis was noted for panicle length and grain yield per plant in sodic conditions. Above studies suggested that for crop improvement it would be desirable to follow different selection methods/breeding methods to be improve varieties and yield also.

Keywords: rice, heterosis, inbreeding depression, segregating generation, grain yield, physiological parameters

Introduction
Rice is the important cereal food crop and serves as the primary source of staple food for more than half of the global population. Because of higher population growth rate than crop productivity, there are food shortages in most of the area of India. Use of hybrid variety is an important strategy to meet the demand of increasing population. Hybrid rice is an economically viable option to increase cultivars yield potential. Heterosis in yield contributing traits ultimately brought about yield improvement in F1 hybrid rice (Vanaja and Babu, 2004) [7]. The superiority of F1 hybrid over both its parents in terms of yield and some other characters is known as heterosis. Both positive and negative heterosis is useful in crop improvement, depending on the breeding objectives and nature of the traits. Heterosis is useful for deciding the direction of future breeding programme and to identify the superior cross combinations. Knowledge on heterosis together with inbreeding depression would be helpful for identification of poor crosses in early generations. In the present study two crosses were made in rice to study the manifestation of heterosis for yield and its components as well as to estimate the inbreeding depression.

Materials and Methods
The present investigation was conducted during *Kharif*, 2017, 2018 and 2019 at Student's Instructional Farm of Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229 (U.P.), India. The experimental material was based on generation mean analysis set of 2 hybrids (F1), 2 segregant (F2), 2 BC1 and 2 BC2 developed by crossing of six parameters. Six genetically diverse genotypes *viz.*, NDRK 5004, NUD 3, Pant 10, IR 28, CSR 10, Sushk samrat were inter crossed in generation mean analysis fashion were evaluated in Randomized Block Design with three replication during *Kharif* 2019 each plot was consisting of a double row of 3 meter long beds with intra row spacing spaced 20 cm apart. Seed to seed distance within a row will be kept 15 cm. Similar planting distance will be maintained for P1, P2, F1's, F2's, and B1 and B2.The desired observation will be recorded on five randomly selected plants for parents, 10 plants for F1's, 15 plants for B1, B2 and 20

Scanned by CamScanner

Int.J.Curr.Microbiol.App.Sci (2020) *9*(9): 445-452

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 9 (2020)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2020.909.056

Genetic Variability, Heritability and Genetic Advance for Yield and its Contributing Traits in Chickpea (*Cicer arietinum* L.)

Vartika Singh[1*], S.C.Vimal[1], Shiv Prakash Shrivastav[1], Virendra Maurya[1] and Nidhi Singh[2]

[1]*Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad -224 229 (U.P.), India*
[2]*Department of Genetics and Plant Breeding, Tilakdhari Post Graduate College, Jaunpur-222002, (U.P.), India*

**Corresponding author*

Keywords

chickpea (*Cicer arietinum L.*), Genetic variability, Heritability, Genetic advance, Seed yield, Quality parameter

Article Info

Accepted:
07 August 2020
Available Online:
10 September 2020

ABSTRACT

The experiment on forty genotypes along with three check varieties of chickpea (*Cicer arietinum* L.) were assessed to work out the genetic variability, heritability and genetic advance effects of their various attributes on seed yield. The high magnitude of genotypic and phenotypic coefficients of variation were observed for seed yield per plant, 100- seed weight, seeds per pod, primary branches per plant and pods per plant, indicating thereby, substantial scope for improvement in this character after hybridization and subsequent selection and the high estimate of heritability with high genetic advance in per cent of mean were observed for 100-seed weight, seed yield per plant and seeds per pod. The highest seed yield per plant was produced by KWR 108 (18.84 g), while the lowest seed yield per plant were given by BGD 1081 and Phule G 0405 (6.60g). High heritability and genetic advance indicate that the additive nature of gene action and reliability of those characters for selection and emerged as ideal traits for improvement through selection.

Introduction

Chickpea (*Cicer arietinum* L.) crop is self-pollinated and diploid (2n =2x = 16) species. It is belongs to genus *Cicer*, tribe Cicereae, family Fabaceae, and subfamily Papilionaceae. It originated in south-eastern Turkey. The *Cicer* is of Latin origin, derived from the greek word 'kikus' meaning force or strength. Among pulse, chickpea occupies a premier position in respect of area and production in the world. It is grown in an area 13.20 m ha and the production is around 11.60 m tonnes with an average productivity of 880 kg per ha. India is also greater consumer as well as importer of chickpea in the world. In India, chickpea is grown about 9.93 m ha area and producing 9.53 m tonnes grain with productivity of 960 kg per ha. In Utter Pradesh, it is cultivated on area of 577

Scanned by CamScanner

YIELD GAP ANALYSIS THROUGH FRONT LINE DEMONSTRATION IN WHEAT CROP

R.L. Singh* ,Pradip Kumar **, S.N.Singh*and O.P.Verma******
Krishi Vigyan Kendra, Gonda UP

Abstract

Front Line Demonstrations were conducted to find out the yield gap on wheat crop. Krishi Vigyan Kendra, Basti conducted 80 demonstrations with a total area of 32.0 ha. on high yielding wheat variety PBW-502 during two consecutive years 2008-09 and 2009-10 . Demonstraions were conducted in twelve villages covering five blocks of the district. Each demonstration area was 0.4 ha. Line sowing through seed drill machine was done in FLD plot while broadcast sowing of seed was done in Farmer's practice. Prevailing farmer's practices were treated as control for comparison to recommended practices. Wheat variety PBW-343 was sown under Farmer`s practice. The average yield of demonstrated plot was obtained 55.78 q / ha. over control (44.75 q / ha.) with an additional yield of 11.03 q/ha having an increase of 24.65 percent. The average Extension gap was 11.03 q / ha. Technology gap 9.22 q / ha. while technology index was found 14.18 percent.

Key word: Front Line Demonstration, Transfer of Technology, Recommended practices, yield gap, Wheat

Introduction

Rice-wheat is a predominant crop rotation of district Basti. Wheat (Triticum aestivum) is the second most important cereal crop in India after rice contributing substantially to the national food security by providing more than 50% of the calories to the people who mainly depend on it. In historical perspective India has made spectacular advancement in productivity and sustainability of wheat and wheat-based cropping system. The scenario of the past ten years has clearly indicated that the wheat production in the country has soared ahead despite area remaining the same. The wheat programme has released 399 wheat varieties, comprising 355 bread wheat, 54 durum, 5 dicoccum and 5 triticale for cultivation under different zones. (Anonymous, 2012).

Wheat is an important cereal crop of Basti district of Uttar Pradesh. The district has been considered as productive potential of wheat crop due to assured irrigation facilities and favorable soil and climatic conditions. In the district wheat is grown in an area of 1.19 lac ha. with a production of 3.79 lac tons having productivity of 31.79 q/ha while in UP total area is 98.85 lac ha. with a production of 349.71 lac tons having productivity of 35.38 q/ha (Faslotpadan ki ranneeti,Rabi Abhiyan 2016-17, Deptt. Of Agric. UP). However, there is still a wide gap between the production, potential and the actual production obtained by the farmers. This may be due to partial adoption of recommended package of practices by the wheat growers. Technology gap is a major problem in increasing wheat production in Basti district of U.P State. So far, no systematic effort was made to study the technological gap existing in various components of wheat cultivation.

Materials and Methods

The study was carried out by Krishi Vigyan Kendra Basti during rabi 2008-09 and 2009-10 on the farmer's field of 12 adopted villages covering five blocks of the district. Front Line Demonstrations were conducted under National Food Security Mission. Seed of Wheat variety PBW-502 was procured from Agriculture Deptt. of the district. Demonstration plot was sown under the supervision of KVK scientists. A total of 32.0 ha. area with each plot size 0.4 ha was under Front-line demonstrations using Wheat variety PBW-502 with active participation of 80 farmers. Before conducting FLDs, farmers were selected for group meeting and conducting FLDs. A specific skill training was given to the selected framers regarding package of practices of wheat. The difference between Demonstration package of practices and Existing farmers practices are given in Table 1.

In general, the soils under study were sandy loam in texture with a PH range in between 7.0 to 7.5. The available nitrogen, phosphorous and potassium varied between 100-250, 26-60, 150-300 Kg/ha, respectively. However, the soils were deficient in micro nutrients particularly in zinc.

In demonstration plots use of quality seed of improved variety, timely sowing, weeding, need based use of pesticides, herbicides as well as balanced fertilization, and irrigation were emphasized. First irrigation was given at 21 days after sowing at CRI stage, second was given at tillering stage at 40-45 DAS, third at knot formation at 60-65 DAS, fourth at heading and fifth at milking stage while in Farmer practice four irrigations were given. The traditional practices were maintained in case of local check. The data were collected from both FLD plots as well as control plot and finally the extension gap, technological gap, technological index (Samui et al,2000) along with the benefit-cost ratio were calculated as given below.

Technology gap= Potential yield- Demonstration yield

Extension gap= Demonstration yield – Farmers practice yield

Technology index= (Potential yield- Demonstration yield) X100 / Potential yield

Table-1: Comparison between demonstration package of practices and existing Farmer practices in wheat crop

Sl. No.	Particulars	Demonstration practices	Farmer Practice
1.	Farming situation	Irrigated	Irrigated
2.	Variety	PBW-502	PBW-343
3.	Time of sowing	November	November
4.	Method of sowing	Line sowing through seed drill	Broadcast
5.	Seed treatment	Use of treated seed by carbendagym @ 2 g/kg of seed	Without seed treatment
6.	Seed rate	100 kg/ha	125 Kg/ha
7.	Fertilizer dose	NPK (150:60:60)	NPK (150:60:00)
8.	Plant Protection	Application of bio fungicide Beuvaria bassiana	Injudicious use of pesticide and fungicides
9.	Weed management	Spraying of Sulfosulfuron 75% @ 32 ml/ha. + metsulfuron methyl 5% @ 40 g/ha. during 30-35 days after sowing	Use of Isoproturon 75 % @ 1.0 kg / ha.at 30-35 days after sowing

Table -2 Yield, Technology gap, Extension gap and Technology index in Wheat under Front Line Demonstration

	Grain Yield (q/ha)			% increase over control	Technology gap (q/ha)	Extension gap (q/ha)	Tech. index %
Year	Potential	Demo.	FP (Control)				

Plant Archives Vol. 17 No. 1, 2017 pp. 181-186 *ISSN 0972-5210*

YIELD PERFORMANCE OF COLLECTED WILD MILKY MUSHROOM (*CALOCYBE* SP.)

Vivek Singh, Pradip Kumar*, Sanjeev Kumar and Ketan Kumar

Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad - 224 229 (U.P.), India.

Abstract

Milky mushroom (*Calocybe indica*) is an indigenous tropical edible mushroom becoming popular among people these days during summer and rainy season. The morphological characters like pileus size, stipe size, gills, spore print colour and colonies characters of a wildly collected *Calocybe* sp. (DMRO-600) were found as 4.50- 6.16 cm, 7.5- 8.5cm, distinctly formed crowded with emarginated, white and circular with creamy white, respectively. Out of five grain substrates evaluated for spawn production, wheat grains proved as best substrate followed by sorghum grains, pearl millet grains and soybean product (Nutrella). For cultivation of this mushroom, five locally available substrates in pure form and in combinations with wheat straw were evaluated. Out of these, wheat straw substrate gave highest yield (1052.50 g), maximum number of fruiting bodies (40.75), early spawn run (21.50 days) along with early first harvest (33.25 days), followed by yield obtained from wheat straw + paddy straw (932.50 g), paddy straw (841.25 g), wheat straw + sugarcane bagasse (840.56 g), sugarcane bagasse (825.0 g), maize straw (703.75 g), wheat straw + maize straw (596.25 g), wheat straw + dehulled maize cobs (543.75 g) and dehulled maize cobs (503.75 g). Hence this study confirms the suitability of locally wild strain DMRO-600 for cultivation to mushroom growers by using wheat grains for spawn production and wheat straw as substrate for its cultivation for achieving higher yield.

Key words : *Calocybe* sp., spawn, substrates, yield.

Introduction

Milky mushroom (*Calocybe indica* P & C) was first reported in India by Purkayastha and Chandra in 1974. It belongs to the kingdom Fungi, phylum Basidiomycota, class Agaricomycetes, order Agaricales and family Lyophyllaceae. This is an indigenous tropical mushroom, suitable for cultivation during summer and rainy season. It naturally grows on the humus rich soil under road side tree, in garden and forest during rainy season. Wildly collected species of *Calocybe* were sold in Kolkata, Tamil Nadu and Rajasthan and their nutritional and medicinal quality were confirmed by Purkayastha and Chandra (1974), Doshi *et al*. (1989) and Krishnamoorthy (1995). In India, mushrooms vernacularly known as "*Khumbi*", "*Chhatra*", "*Kukurmutta*", "*Dhengri*", "*Dharti ka phool*", "*Doodh chatta*" etc.

A substrate is an important substance for making spawn and growing mushrooms. Various kinds of agricultural wastes including wheat straw, paddy straw, maize, bajra, cotton stalks and leaves, sugarcane bagasse, dehulled maize cobs, tea and coffee waste and coconut coir substrate can be utilized for cultivation of *Calocybe indica*. There is no need to compost the substrate for its cultivation as the mycelium can degrade the cellulose, hemicelluloses and lignin by secretion of various extracellular enzymes. This mushroom requires a temperature of 30-35ºC and relative humidity of 70-80% for cultivation which is conducive to environmental conditions of most part of India (Singh *et al*., 2009; Amin *et al*., 2010; Upadhyay, 2010 and Gitte *et al*., 2014). During last decade milky mushroom has become a major commercially cultivated species in south India particularly Tamil Nadu, Andhra Pradesh and Karnataka and during last 4-5 year its cultivation has become popular in north India as well. Its high biological efficiency (100%), better keeping quality, white attractive colour, suitable for pickle and chutney, can be grow on wide range of agricultural wastes and simple cultivation technique are major factors

Author for correspondence : E-mail: pradipnduat07@gmail.com

Journal of AgriSearch, 8 (3): 241-248
An Open Access International Peer Reviewed Quarterly

ISSN : 2348-8808 (Print), 2348-8867 (Online)
https://doi.org/10.21921/jas.v8i03.1669

Yield Loss Assessment due to Alternaria Blight Disease in Rapeseed and Mustard

H K SINGH[1*], PRADIP KUMAR[1] AND S K SINGH[2]

ABSTRACT

An experiment was conducted to assess the yield losses due to Alternaria blight in different released cultivars of rapeseed-mustard during Rabi 2016-17 and 2017-18 planting 15 varieties of the rapeseed-mustard namely RH-749, Pusa gold, KBS-3, GSL-5, GSL-2, Pusa mustard-27, Jhumka, Anuradha, PT-30, T-27, PM-25, Pusa aditya, PT-303, Sheetal, TMLC-2 in six replications. The minimum disease severity on leaves and pods were recorded in protected and unprotected conditions in the variety GSL-5 (2.65% and 16.26%), (1.75% and 6.32%) followed by GSL-2 (3.20% and 19.72%), (1.89% and 6.75%) Pusa aditya (6.91% and 19.89%), (2.18% and 7.20%) and Sheetal (7.99% and 23.13%), (3.21% and 7.43%), respectively. On the basis of mean values the minimum infection rate on pods was recorded GSL-2 (0.083 and 0.042) followed by Pusa aditya (0.089 and 0.045), respectively. The minimum AUDPC on leaf under protected and unprotected was recorded on cultivar GSL-5 (76.40 and 496.20) followed by GSL-2 (88.80 and 596.85), Pusa aditya (205.35 and 588.25), Sheetal (241.70 and 717.30) and RH-749 (244.95 and 950.85), respectively. Whereas the minimum AUDPC on pod was recorded with variety GSL-5 (32.10) and Pusa aditya (200.25) followed by [GSL-2 (34.65) and Sheetal (206.65)], [Pusa aditya (39.35) and RH-749 (566.41)] and [Sheetal (60.95) and Pusa mustard-27 (741.75)], respectively. The maximum yield avoidable loss (%) was recorded T-27 (46.67%) followed by Jhumka (44.53%, Anuradha (40.00%), KBS-3 (38.77%) and Pusa gold (34.13%), respectively. Minimum avoidable loss (%) was recorded on cultivar GSL-5 (11.09%) followed by Anuradha (14.36%), GSL-2 (17.73%), RH-749 (17.90%) and Pusa aditya, respectively. In present investigation out of 15 genotypes examined for blight resistance, GSL-5, Pusa Aditya, Sheetal and GSL-2 exhibited good level of partial resistance i.e. moderately resistance. Other 11 varieties RH-749, Pusa gold, Pusa mustard-27, Jhumka, Anuradha, PT-30, PT-303, T-27, KBS-3, TMLC-2 and PM-25 were susceptible based on the mean basis severity (PDI), reduced apparent infection rate and lesser value of AUDPC.

KEYWORDS

Rapeseedmustard, variety, yield loss, fungicides, Alternaria brassicae

ARTICLE INFO

Received on	:	12/04/2021
Accepted on	:	05/07/2021
Published online	:	05/09/2021

CC BY SA

INTRODUCTION

Rapeseed-mustard is one of the major oilseed crops cultivated in India and around the world. It is extensively grown traditionally as a pure crop as well as intercrop (mixed crop) in marginal and sub-marginal soils in the eastern, northern and north-western States of India (Singh *et al*, 2017). Rapeseed and mustard belong to family Brassicaceae, Indian mustard commonly known as *rai* is the most important member of Cruciferous oil seeds occupying nearly 70 per cent of the total area under rapeseed-mustard (Singh *et al*, 2014b). The leaves of young plants are used as green vegetable and whole plants as green fodder. The seeds are highly nutritive containing 38 to 57 per cent erucic acid, 4.7 to 13 per cent linoleic acid and 27 per cent oleic acid (Singh *et al*, 2011). The rapeseed and mustard group dominates among oilseed crops in area and production on global level. India is one of the largest rapeseed-mustard growing countries in the world, occupying the third position in area and production after China and Canada sharing 12 per cent of world's total production. At global level, rapeseed-mustard is cultivated on 5.96 million hectares with production of 8.32 million tonnes and productivity of 1397 kg/ha (Anonymous, 2018). Rapeseed-mustard is the second most important oilseed crop after groundnut and accounts for nearly 30.7 per cent of the total oilseed production in the country. There are several diseases known to affect the mustard crop but foliar diseases like Alternaria leaf spot, white rust (blister), downy and powdery mildews cause heavy yield losses to the crop. Alternaria blight caused by Alternaria brassicae (Berk.) Sacc and Alternaria brassicicola (Schw) Wiltshere is a world-widely distributed and economically important disease on rapeseed (Brassica napus), mustard (Brassica campestris) and other brassicas (Singh *et al*, 2014a), Tewari and Conn (1993) , Kumar (1997), Meah *et al* (2002), Meena *et al* (2010). The characteristic symptom is the development of circular spots on leaves and pods with concentric ring. Later on spots coa-

[1] Department of Plant Pathology, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Uttar Pradesh 224 229, India
[2] Crop Research Station, Bahraich, Acharya Narendra Dev University of Agriculture & Technology, Kumarganj, Uttar Pradesh 224 229, India
*Corresponding author email: hksndu@gmail.com

The Pharma Innovation Journal 2021; 10(8): 1476-1477

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(8): 1476-1477
© 2021 TPI
www.thepharmajournal.com
Received: 02-05-2021
Accepted: 13-06-2021

Rang Nath Pandey
M.Sc. Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pradip Kumar
Assistant Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

OP Rao
Professor, Department of Horticulture and Agro-Forestry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rang Nath Pandey
M.Sc. Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Study on genetic variability in germplasm of coriander (*Coriandrum sativum* L.)

Rang Nath Pandey, CN Ram, Pradip Kumar and OP Rao

Abstract
The present investigation was conducted during *Rabi* season 2019-20 at Main Experimental Station of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (UP). The field experiment was layout in Augmented Block Design with 70 genotypes with 3 check in 5 blocks. The character studied were days to 50 per cent flowering, plant height (cm), branches per plant, fruiting nodes per plant, inter-nodal length (cm), umbel diameter (cm), number of umbels per plant, number of fruits per umbel, number of umbellates per umbel, number of fruit per umbellate, 1000 seed weight (g), seed yield per plant (g). Analysis of variance due to the block were highly significant for all character except day to 50 per cent flowering, fruiting nodes per plant and test weight. Highest genotypic and phenotypic coefficient of variation was recorded for branches per plant. High estimate of heritability was expressed for plant height and fruit per umbel, while high genetic advance in per cent of mean observed for branches per plant (23.60).

Keywords: Coriander, heritability, variability, PCV, GCV and genetic advance

Introduction
Coriander *(Coriandrum sativum* L, 2n=2x=22) is an annual herb and grown for both green leaf and dried seeds. It is extensively grown in Andhra Pradesh, Tamil Nadu, Karnataka, Punjab, Rajasthan, M.P. and Uttar Pradesh. Rajasthan is the main growing state and contribute about 40 per cent production in India. In India it is grown in 6,29,000 ha area with annual production of 7,56,000 MT and 1.20 MT per hectares productivity (Anonymous 2020) [2].
The coriander plant has a fragrant odour and pleasant aromatic taste. Dry seeds contain 0.1- 1 percent essential oil which impart odour and taste. The principle constitute of essential oil is dextro- linalool. The volatile oil is used in cosmetics products and beverages. Dried seeds are used in flavouring sauces and meat product, some bakery and confectionary items. It is also used as major ingredient in most of the curry product. The fruit are considered as carminative, diuretic, anti-bilious, refrigerant andaphrodisiac. Coriander belongs to the family Apiaceae, which is consisting of 300 genera and more than 3,000 species. It is an annual herb with thin stem bushy appearance and 90-100 cm in height. Leaves are alternate, compound and petiole has a pair of stipules sheathing the stem base. The lower leaves are broad pinnate and have long petiole with crenately lobed margins. The upper leaves are cut with linear lobes and bi or tri- pinnate. The flowers are pink or white. The seeds are green round (botanically fruit) attain greyish brown colour at maturity.
Genetic variability is a pre-requisite for any improvement in a crop. The success of any crop improvement programme depends on the magnitude of genetic variability and extent to which the desirable characters are heritable. The ultimate goal of breeding programme aims to improve the characteristic of plants so, that they become more desirable. The survey of genetic variability with the help of suitable genetic parameters like genotypic and phenotypic coefficient of variations, heritability estimates and genetic advance as percentage of mean are indispensable in breeding programmes aimed at improvement of seed yield.

Materials and Methods
The present investigation entitled "Study on genetic variability for growth, yield and its attributing traits in coriander (*Coriandrum sativum* L.)" carried out at the Main Experiment Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) India, in Augmented Block Design during *Rabi* season 2019-20 using Seventy genotypes with three checks (Hisar Anand, NDCor-1 and NDCor-2) of coriander collected from Department of Vegetable Science, Acharya Narendra

© 2017 *RELS*
http://rels.comxa.com
rel_sci@yahoo.com

ISSN: 0974-4908
Res. Environ. Life Sci.
10(7) 599-601 (2017)

Standardization of system of rice intensification (SRI) and its comparison to conventional system of rice production for resource conservation and yield maximization

Pradip Kumar *[1], Ram Lakhan Singh[2], J.P. Srivastava[1], S.P. Singh[3], V.P. Chaudhary[1] and H.K. Singh[1]
[1]Department of Plant Pathology, [2]SMS Agronomy, [3]Director Extension
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229, U.P., India
***e-mail:** pradipnduat07@gmail.com

(Received: August 09, 2016; Revised received: January 18, 2017; Accepted: January 21, 2017)

Abstract: An experiment was conducted at Krishi Vigyan Kendra, Basti (UP) with two high yielding rice varieties to standardize the System of Rice Intensification (SRI) method including the age of seedling and variable spacing. The SRI standardized package was compared with the conventional production system of rice at farmer's field. Maximum grain yield (66.80 q/ha) along with all the contributing traits i.e. plant height (130.0 cm), root depth (30.0 cm), root spread (20.66 cm), root biomass (16.75 g/m²), number of tillers (36), spikes (27), spike length (32.66 cm), grains/spike (285), test weight (37.3 g) and grain yield (66.80 q/ha) were recorded in variety NDR-359 with 10 days of seedling age planted at 25 X 25 cm spacing. Similar trend of observations were also recorded through this spacing in case of variety PNR-113, where, plant height (120.33 cm), root depth (27.0 cm), root spread (16.66 cm), root biomass (16.80 g/m²), number of tillers (33), spikes (26), spike length (28.60 cm), number of grains/spike (282), test weight (35.25 g) and grain yield (65.70 q/ha) witnessed. At farmer's field in demonstration trial 14.44 per cent increase in grain yield through SRI practice was remarkable. It is an eco-friendly approach because it helps in resource conservation owing to its need of less exploitation of ground water, no use of any weedicide and minimum use of other hazardous chemicals (insecticide/ fungicide).

Key words: Rice, SRI, Seedling age, Spacing

Introduction

Rice (*Oryza sativa* L.) being the most important staple cereal crop providing one third of calorie requirement for more than 70 per cent of Indian population. Globally, India ranks first in area and second largest producer next to China in rice production. The diverse agro-ecological situation demand location specific management technology for the realization of full yield potential. The current global population of more than 7.5 billion is expected to reach 9.0 billion by 2050 AD. Most of these population increases will occur in developing countries of Asia and Africa where rice is a staple food. To meet the increasing demand an annual increase of 2.0 million tons in deteriorating resource base and climate change affecting adversely is indeed a harculum task. Improvement and strengthening of genetic base, adoption of hybrid rice and refinement of production technology packages are some of the options on which the emphasis is being given. The semi-aquatic nature of rice and high water requirements for its cultivation make it much more prone to losses from drought during reproductive phase. Indian agriculture largely depends upon monsoon rainfall where about two third of the arable land lack irrigation facilities and is termed as rain fed. The most immediate consequence of drought is a fall in crop production due to inadequate and poorly distributed rainfall. Also the weeds are major constraints in rice production because they compete with crop plants for moisture, light, nutrients and space. Both these problems (Better water as well as weed management) are addressed under SRI system. Although, in SRI fields weeds intensification is higher as compared to traditional transplanting system due to wetting and drying of fields. A little increase in production (4.31mt.) was witnessed during 2013-14 as compared to its previous year but again there was a backdrop (Anonymous, 2015).

The system of rice intensification (SRI) which was developed by father Henri de laularie in 1980s in Madagascar (Barkelaar, 2001) has already been adopted in many countries. The pronounced effect of the system has been recorded in more than 26 countries including China, Japan and other big players of rice production. Usually, under this system a package has been developed including seed rate (2 kg/acre), age of seedling (8-12 days), Khusral and Aminus (2009), number of seedlings (single / hills), spacing (25 X 25 cm) with moist field avoiding flooding, weeding (Cano weeder) and supplementations of organic manuring etc. (Krishna and Biradar Patil, 2009). The average yield thus recorded by more than 20 countries including China ranging between 7-8 t / ha and even more (12 t / ha). As per report from Anant Pur district of Andhra Pradesh, the average yield ranged from 6.5 to 8.5 t / ha. As a strategy, the seed replacement rate may be increased and the

Indian Phytopath. 69 (4s) : 394-396 (2016)

RESEARCH ARTICLE

Management of powdery mildew of rapeseed-mustard

H.K. SINGH[1]*, KETAN KUMAR[1], PRADIP KUMAR[1], SUNITA SINGH,* R.B. SINGH[1], K.N. MAURYA[2] AND M.P. CHAUHAN[2]
[1]Department of Plant Pathology, [2]Department of Genetics and Plant Breeding, B-72, University Campus, N.D. University of Agriculture and Technology, Kumarganj, Faizabad 224 229, Uttar Pradesh, India

ABSTRACT: Out of 200 genotypes screened, 20 genotypes, namely, EC-414309, PBC-9221, NPC-14, BAUSM-92-1-1, PBC-2004-1, EC-339000, EC-338997, GSL-1, HNS-004, ONK-1, NRCDR-515, PBC-2002-2, NPC-15, OCN-3, EC-399299, NUDB-26-11, CAN-133, NPN-1, RGN-55, NRCR-837 showed consistently resistant reaction in both the years, while nine genotypes *viz.*, EC-399296, EC-399301, EC-399313, PHR-2 , CAN-130, RAURD-101, RH-9301, SKM-9328, IJWHJ-001 were moderately resistant. Besides these, 30 genotypes exhibited moderately susceptible, 71 susceptible and 70 highly susceptible reactions. Three sprays of aqueous suspensions of Triademefon (0.1%), Wettable sulphur (0.3%), Dinocap (0.1%) and Myclobutanil (0.1%) at 15 days intervals, after disease appearance, controlled the disease effectively and increased seed yield. The maximum per cent disease control was recorded with spray of Triademefon upto 76.88 per cent. Wettable sulphur, Dinocap, Myclobutanil, Water spray inhibited the disease upto 74.50, 73.11, 67.66, 63.78 per cent, respectively. The significantly higher mean seed yield of 1435kg/ha was recorded with treatment Triademefon 0.1% followed by Wettable sulphur @ 0.3% (1330 kg/ha) and Dinocap @ 0.1% (1250 kg/ha). Similar trends were also recorded in case of test weight.

Key words: Powdery mildew, Resistance, Fungicide, Rapeseed and mustard

Rapeseed and mustard is the major oilseed crop of Uttar Pradesh, which is severely affected from powdery mildew disease caused by *Erysiphe cruciferarum* Opiz. Ex Junnel, a minor disease earlier, this, has become major one during recent years in late sown crops and cause heavy yield losses up to 42.4% (Singh and Singh, 2003; Singh and Singh, 2004). Disease occurs between second weeks of February to first week of March. The resistance breeding is one of the most economical methods for the management of the diseases. Therefore, investigations were conducted to identify sources of resistance and fungicides for effective in managing the disease.

MATERIALS AND METHODS

Field experiments were conducted at the University Experiment Station at Kumarganj (26°47'N, 82°12'E, 113 msl), Faizabad, Uttar Pradesh during *rabi* 2012-13 and 2013-14 crop seasons following recommended agronomic practices (120Kg N, 60Kg P, 60Kg/ha).

Varietal screening

Two hundred genotypes of rapeseed-mustard were evaluated for their response to powdery mildew under late sown condition at the Research Farm of Genetics and Plant Breeding of this University. The trial was conducted in the third week of December in single row of 3m length having 30 x 10 cm spacing in augmented design. Susceptible check Varuna was sown after every five test genotypes and flanked the trial all around with paired rows to serve as infector. Disease severity was recorded on three leaves one each from top, middle and bottom from ten randomly selected plants from each genotype, after the appearance of for about a month according to 0-5 scale. The disease was scored, following the scale, 0: Free- apparent symptoms absent; 1: Resistant - 1-10% leaf area mildewed; 2: Moderately resistant - 11-25% leaf area mildewed; 3: Moderately susceptible-26-50% leaf area mildewed; 4: Susceptible - 51-75% leaf area mildewed; 5: Highly susceptible - Over 75% leaf areas mildewed.

Fungicidal management

The cultivar 'Varuna' was sown in last week of December in randomized block design having 4m x 3m plot size with 30 x 10 cm plant spacing in three replications. The effectiveness of different fungicedes *viz.* Triademefon (Bayleton) 25WP @ 0.1%, Wettable sulphur (Sulfex) 80WP @ 0.3%, Dinocap (Karathane) 48EC @ 0.1% and Myclobutanil 0.1% concentration along with water spray were tested against the disease severity and seed yield of the crop. The required amount of each chemical was calculated, weighed and the spray solution was prepared and then volume was made up to desired level and was sprayed by using high volume Knap-sak sprayer of 10 litre capacity. Three sprays of each chemical, first at appearance of the disease and remaining two after 15 days intervals were given. Highest severity grades obtained on individual sample plants were used for evaluating % disease index (PDI) following formula given by Singh and Singh (1982). Over all seed yield, 1000-grain weight and avoidable seed yield loss (%) for individual treatments were also recorded in respect to each treatment.

*Corresponding author: hksndu@gmail.com

POSSIBILITIES OF HIGH YIELDING HYBRID AND SCENTED RICE VARIETY PRH-10 THROUGH FRONT LINE DEMONSTRATIONS

R.L. Singh*, Pradip Kumar ** S.N.Singh*and O.P.Verma******

Abstract

Front Line Demonstrations were conducted to find out the yield gap on rice crop. Krishi Vigyan Kendra, Basti conducted 35 demonstrations with a total area of 7.0 ha. on hybrid and scented Rice variety PRH-10 during two consecutive years Kharif 2010 and Kharif 2011. Demonstraions were conducted in thirteen villages covering three blocks of the district. Each demonstration area was 0.2 ha. Transplanting was done in FLD as well as in Farmer's practice. Scented rice variety Type-3 was transplanted under Farmer`s practice. The average yield of demonstrated plot was obtained 44.78 q / ha. over control or Farmer`s practice (35.57 q / ha.) with an additional yield of 9.21 q/ha having an increase of 25.89 percent. The average Extension gap was 9.21 q / ha. Technology gap was 20.22 q / ha. while technology index was found 31.09 percent. In reference to economics, Net returns and Benefit-Cost ratio were 27964 and 1.92 in demonstration and 16741 and 1.57 in farmer's practice respectively. Net returns and Benefit –Cost ratio both were higher in case of demonstration over farmer's practice.

Key word: Front Line Demonstration, Transfer of Technology, Recommended practices, yield gap, Rice

Introduction

Rice-wheat is a predominant crop rotation of district Basti. Rice (Oryza sativa) is the most important cereal crop in India contributing substantially to the national food security. Rice provides 21% global human per capita energy and 15% of per capita protein. Although rice protein ranks high in nutritional quality among cereals, protein content is modest. Rice also provides minerals, vitamins and fiber, although all constituents except carbohydrates are reduced by milling.

The world average consumption of rice in year 1999 was 58 kg with the highest intake in some Asian countries. Mayanmar has the highest annual consumption i.e. 211 kg per capita. Rice eaters and growers constitute the bulk of the world. In India annual rice consumption was 74 kg per capita, Total calories per capita per day was 2417 in which rice calories was 736 which accounts 30%. (FAO online database update 31 may 2001)

Rice is an important cereal crop of Basti district of Uttar Pradesh. The district has been considered as productive potential of rice crop due to assured irrigation facilities and favorable soil and climatic conditions. The district lies in North Eastern Plain Zone under nine Agro climatic zones of UP. In year 2016-17 the district Rice is grown in an area of 1.02 lac ha. with a production of 2.11 lac tons having productivity of 20.64 q/ha while in UP total area is 59.66 lac ha. with a production of 143.96 lac metric tons having productivity of 24.13 q/ha (Kharif Faslon ki saghan padhyatiyan, Krishi Vibhag Uttar Pradesh, 2018).

However, there is still a wide gap between the production, potential and the actual production obtained by the farmers. This may be due to partial adoption of recommended package of practices by the rice growers. Technology gap is a major problem in increasing wheat production in Basti district of U.P State. So far, no systematic effort was made to study the technological gap existing in various components of rice cultivation. Now many farmers have adopted hybrid rice due to higher yield but quality of rice is poor. Keeping this view in mind the Hybrid and scented rice variety PRH -10 was taken under study. This variety was released in year 2001.It is suitable for irrigated conditions. It has excellent aroma, extra-long grains. It possesses tolerance for shattering. It is resistant to gall midge, brown spot and moderately resistant to leaf folder and blast. Its maturity period is 125-130 days.

Materials and Methods

Front Line Demonstrations were conducted. Seed of hybrid and scented Rice variety PRH-10 was procured from Agriculture Deptt. of the district. Demonstration plot were transplanted under the supervision of KVK scientists. The study was carried out by Krishi Vigyan Kendra Basti during kharif 2010 and Kharif 2011 on the farmers field of 13 adopted villages covering three blocks of the district. A total of 7.0 ha. area with almost each plot size 0.20 ha was under Front-line demonstrations using Rice variety PRH-10 with active participation of 35 farmers. Before conducting FLDs, farmers were selected for group meeting and conducting FLDs. A specific skill training was given to the selected framers regarding package of practices of wheat. Prevailing farmer's practices were treated as control for comparison to recommended practices. The difference between Demonstration package of practices and Existing farmers practices are given in Table 1.

In general, the soils under study were loam in texture with a pH range in between 7.0 to 7.5. The available nitrogen, phosphorous and potassium varied between 100-250, 26-60, 150-300 Kg/ha, respectively. However, the soils were deficient in micro nutrients particularly in zinc.

In demonstration plots use of quality seed of improved variety, timely sowing, weeding, need based use of pesticides, herbicides as well as balanced fertilization and irrigations were emphasized. Irrigations were given at just after transplanting, heading, flowering and grain filling stages. Gap filling was done after 7-10 days after transplanting in demonstration plot. The traditional practices were maintained in case of local check. The data were collected from both FLD plots as well as control plot and finally the extension gap, technological gap, technological index (Samui et al,2000) along with the benefit-cost ratio were calculated as given below.

Technology gap= Potential yield- Demonstration yield

Extension gap= Demonstration yield – Farmers practice yield

Technology index = $\frac{\text{(Potential yield- Demonstration yield) X100}}{\text{Potential yield}}$

Table-1: Comparison between demonstration package of practices and existing Farmer`s practices in rice crop

Sl. No.	Particulars	Demonstration practices	Farmer`s Practice
1.	Farming situation	Irrigated	Irrigated
2.	Variety	PRH-10	Type-3
3.	Time of sowing nursery	Mid-June	Mid-june
4.	Method of sowing	Transplanting	Transplanting
5.	Seed treatment	Use of treated seed by carbendagym @ 2 g/kg of seed	Without seed treatment
6.	Seed rate	15 kg/ha	30 Kg/ha
7.	Fertilizer dose	NPK (150:60:60) Use of ZnSO4 @ 25 kg/ha	NPK (150:60:00) No use of ZnSO4

Plant Archives Vol. 18 No. 2, 2018 pp. 2543-2544 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY AND ANALYSIS OF INCOME AND EXPENDITURE LEVEL OF POTATO (*SOLANUM TUBEROSUM*) UNDER DIFFERENT SIZE OF HOLDINGS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

The main objective of the present study was to work out the income and expenditure level of potato by the use of bio fertilizer along with organic and inorganic fertilizer also in randomly selected villages of district Ghazipur, U.P. during 2011-12. It was found that yield and net return was increased from smaller to large farm ranges increasing trends under demo and local checks. Benefit cost ratio also ranges increasing from smaller to larger ones. The study concludes that yield and net return was increased only due to proper use of organic and bio fertilizer management, this study further concludes that in future more better use of organic and bio fertilizer management produces more yield and better net return in all size groups.

Key words: Yield, bio fertilizer, increasing trends.

Introduction

The potato crop has a special value as food. Potato belongs to the family Solanaceae. It occupies the largest area under any single vegetable in India. The consumption of potato per head in our country is not very much highered in comparison to others. This crop needs irrigation at frequent intervals. Five to six irrigations are sufficient. Potato tubers are planted either whole or cut into pieces sowing time is mid of September to the first week of January. Where crop has been sown in plains of the Northern area. Two successive crops can be raised on the same land. Organic manures as play very much important role in the production of yield and quality. This should be put into the soil 3 to 4 weeks before planting 80 Kg. of Nitrogen, full dose of phosphorus and full dose of potash will be incorporated into the soil as basal dressing, rest 40 Kg. of nitrogen should be apply as top dressing at the time of first earthing. Use of proper planting measures resulted to protect the crop from late blight and insect pest etc. Application of good quality of organic manure or FYM along with recommended doses of NPK provides significantly higher yield and better quality reported by Emin Caliskan *et al.* (2004). Organic manures not only been responsible for adding the natural sources of NPK but it play an important role to improve the physical and chemical properties of nutrient, deficiency in the Soil which improves higher tuber yield said by Roust and Neyround (2003). The tuber and their size has been increased when they have got sufficient amount of nitrogen because this is one of the very much most important food as well as Vegetable (crops in our country which is responsible for producing better calories and weight in comparison to others, Application of herbicides or hand weeding resulted higher tuber yield.

Materials and Methods

The present study was conducted along with farmers scientist collaboration in randomly selected village and block namely Sepah of Kasimabad Block. The study has been taken during the Season of 2011-12 in Ghazipur district of Uttar Pradesh. Three farmers have been selected on random basis under small, medium and large size of holdings. The main motto was to increase their production with better quality and also suggested them to compare the advance practices along with local ones.

Plant Archives Vol. 18 No. 2, 2018 pp. 2543-2544 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY AND ANALYSIS OF INCOME AND EXPENDITURE LEVEL OF POTATO (*SOLANUM TUBEROSUM*) UNDER DIFFERENT SIZE OF HOLDINGS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

The main objective of the present study was to work out the income and expenditure level of potato by the use of bio fertilizer along with organic and inorganic fertilizer also in randomly selected villages of district Ghazipur, U.P. during 2011-12. It was found that yield and net return was increased from smaller to large farm ranges increasing trends under demo and local checks. Benefit cost ratio also ranges increasing from smaller to larger ones. The study concludes that yield and net return was increased only due to proper use of organic and bio fertilizer management, this study further concludes that in future more better use of organic and bio fertilizer management produces more yield and better net return in all size groups.

Key words: Yield, bio fertilizer, increasing trends.

Introduction

The potato crop has a special value as food. Potato belongs to the family Solanaceae. It occupies the largest area under any single vegetable in India. The consumption of potato per head in our country is not very much highered in comparison to others. This crop needs irrigation at frequent intervals. Five to six irrigations are sufficient. Potato tubers are planted either whole or cut into pieces sowing time is mid of September to the first week of January. Where crop has been sown in plains of the Northern area. Two successive crops can be raised on the same land. Organic manures as play very much important role in the production of yield and quality. This should be put into the soil 3 to 4 weeks before planting 80 Kg. of Nitrogen, full dose of phosphorus and full dose of potash will be incorporated into the soil as basal dressing, rest 40 Kg. of nitrogen should be apply as top dressing at the time of first earthing. Use of proper planting measures resulted to protect the crop from late blight and insect pest etc. Application of good quality of organic manure or FYM along with recommended doses of NPK provides significantly higher yield and better quality reported by Emin Caliskan *et al.* (2004). Organic manures not only been responsible for adding the natural sources of NPK but it play an important role to improve the physical and chemical properties of nutrient, deficiency in the Soil which improves higher tuber yield said by Roust and Neyround (2003). The tuber and their size has been increased when they have got sufficient amount of nitrogen because this is one of the very much most important food as well as Vegetable (crops in our country which is responsible for producing better calories and weight in comparison to others, Application of herbicides or hand weeding resulted higher tuber yield.

Materials and Methods

The present study was conducted along with farmers scientist collaboration in randomly selected village and block namely Sepah of Kasimabad Block. The study has been taken during the Season of 2011-12 in Ghazipur district of Uttar Pradesh. Three farmers have been selected on random basis under small, medium and large size of holdings. The main motto was to increase their production with better quality and also suggested them to compare the advance practices along with local ones.

Plant Archives Vol. 18 No. 2, 2018 pp. 2361-2362 e-ISSN:2581-6063 (online), ISSN:0972-5210

Short Communication

STUDY OF THE INCOME FROM SORGHUM (JOWAR) UNDER DIFFERENT FARM SIZE GROUPS

Ajit Verma[1], Sarita Srivastava[2], Pradip Kumar[3] and Vinod Singh[4]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.
[3]Department of Plant Pathology, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Farm Management, Crop Research Station, Baribag, Ghazipur (U.P.), India.

Abstract

To judge the income level of the sorghum was the main objective of the present study which has been taken on the farmer's field during 2011-2012 in Ghazipur district of Uttar Pradesh at different from levels in comparison with local checks. It was formed the yield and net income was higher in demo. groups in Comparison to local checks, because all the advance package of practices has been applied properly and timely while local checks are only based on traditional practices, by virtue of lacking the knowledge local checks are suffered. The study has finely been concluded that there should be a wide range in future to increase their productivity and income by applying more and more advance technologies of cultivating the crop.

Key words: Farmers, yield, increasing trends, size groups.

Introduction

Sorghum, popularly known as Jowar. It grain is primarily as human food in various farms, such as Roti or is cooked like rice. Sorghums are also malted, popped and several local preparations are made. Green and dried fodder is the most important roughage for feeding cattle throughout the country. The utilization of grain sorghum as a cattle not very significant, although considerable scope exists. *Rabi* sorghums are wholly confined to black cotton soils, the *Kharif* Sorghums are grown on light soils also on a limited scale. Medium and deep black soils are predominantly suitable for this crop.

Sorghums are grown during in *Kharif* last week of June to July. The differed spread of high yielding varieties tends to enhance the attack of shoot fly on in this verities and the increased midge incidence on the locals, particularly during the *Kharif* Season. Wheat crop yield formed significantly higher after *Kharif* Sorghum, cowpea grain etc. Yield of wheat will be go down only after sorghum by using not a proper dose of organic fertilizer and cost of other sources of factors of production on higher side Sinsinwar (1994). Cultivation of cereal forages along with legumes makes an increased quantity and nutrition's fodder resulted a greater improvement in soil quality. Green forage and dry matter yields formed significantly higher where maize and cow pea has been taken in consequent lines. The increase in the yield of green and dry matters in the intercropping system might be owing to the nutrient sparing effect of leguminous fodder, Tripathy *et al.* (1997). Nutrients requirement of the crop increasing day by day due intensive cropping system etc.

Materials and Methods

The present study has been taken on the field through farmers-scientist collaborations during the year 2011-12 in randomly selected village Nasirpur, Block Devkali of Ghazipur District of Uttar Pradesh Two farmers from each-groups ranging small, medium and large sizes has been randomly selected. The sorghum (Jowar) has been taken on the farmers field during last week of June to first week of July. Suggested the variety C.S.B.-15, Seed rate 15 Kg./ha. along with for better yield NPK application was put into the soil @ 40:20:20 Kg. per hectare. All the recommended package of practices has been applied to the crop during at the time of their needs for better yield and income. A comparative study has also been made through local check from same groups

Plant Archives Vol. 17 No. 1, 2017 pp. 199-200 *ISSN 0972-5210*

MANAGEMENT OF ISARIOPSIS LEAF SPOT OF BER (*ZIZYPHUS MAURITIANA* LAMK.) THROUGH FUNGICIDES

Sanjeev Kumar*, Pradip Kumar, Divya Singh, Prashant Mishra and Sukhvindar Singh

Deparment of Plant Pathology, Narendra Deva University of Agricult. and Tech., Faizabad - 224 229 (U. P.), India.

Introduction

Ber [*Zizyphus mauritiana* Lamk. (Syn. *Z. jujuba* L.)], the Indian jujube is a tropical fruit tree species belonging to the family *Rhamnaceae*. It is also known as Narkelikul, Boroi, Bor, Beri and Indian plum. Indian jujube is one of the two *Zizyphus* species that have considerable horticultural importance. The other one is Chinese jujube. Being native to India, it is now widely naturalized in Africa, Afghanistan, China, Malaysia, Australia and in some Pacific regions. In India it is commonly grown in Rajasthan, Haryana, Punjab, Madhya Pradesh, Bihar, Uttar Pradesh, Maharashtra, Assam and Gujrat. It is a hardy crop that tolerates extreme temperature and thrives under rather dry condition with annual rainfall of 15-225cm. Ber fruit is very nutritious having rich in minerals and vitamins. The fruit is eaten raw or as pickles or used in beverages. In India, the ripe fruits are mostly consumed raw but are sometimes stewed.

Ber crop suffers from a number of fungal diseases. Among them, some important fungal diseases are powdery mildew (*Oidium erysiphoides* f. sp. *zizyphi*), rust (*Phakospora zizyphus vulgaris*), leaf spot (*Tandonella zizyphi*, *Alternaria* sp.) *Cercospora zizyphi*, *Cladosporium zizyphi* and *Phoma* sp.) and mouldy leaf spot (*Isariopsis indica* var. *zizyphi*). However mouldy leaf spot or Isariopsis leaf spot appears in severe form on various ber cultivars and causes maximum yield loss. Gupta *et al*. (1977) reported Isariopsis leaf spots disease for the first time from Haryana. Verma and Kumar (1992) reported that Cloudy weather with moderate temperature during October-November is favourable for the disease development. Black spots, which are sooty, tuft like circular to irregular black spots develop on leaf surface. During advanced stage, the lower surface of leaves also covered in longer area and corresponding upper surfaces show brown discolouration. Thus, the present research was done to find out effective fungicides for management of Isariopsis leaf spot of ber.

***Author for correspondence :** E-mail: drsanjeev44@gmail.com

Materials and Methods

The experiment was conducted during 2010-2013 at Main Experimental Station, Horticulture, N.D.U.A. & T., Kumarganj Faizabad (U.P.), India; on Cultivar 'Gola' to assess the efficacy of fungicides for management of Isariopsis leaf spot of ber. There were 4 replications for each treatment. The spray of fungicides/botanicals @ 10 liter/plant was scheduled just after initiation of the disease under field condition. The fungicides/botanical used for treatment were Mancozeb 0.2%, Carbendazim 0.1%, Copper oxychloride 0.2%, Propiconazole25EC 0.1%, Difenconazole 10WP 0.1% and Neem oil 3.0%.

Observations were recorded on disease incidence/ intensity and yield (kg/ha). The observations in respect of disease intensity on leaves were recorded after 20 days after last spray. Hundred leaves (25 from each side of tree) were observed following 0-5 grade scale of Mckinney (1923) as given in table 1.

Yield data were recorded at the time of harvesting of fruits. The per cent disease index (PDI) and per cent disease control (PDC) were calculated by using following formula.

$$PDI = \frac{\text{Sum of all numerical rating}}{\text{Total no. of leaves examined} \times \text{highest rating}} \times 100$$

$$PDC = \frac{\text{\% disease control} - \text{\% disease in treatment}}{\text{\% disease in control}} \times 100$$

All the treatments were arranged in randomized block design and data were statistically analyzed. Percentage data of disease index and disease control were

Plant Archives Vol. 17 No. 1, 2017 pp. 292-294 *ISSN 0972-5210*

MANAGEMENT OF RUST DISEASE (*RAVENALIA EMBLICAE* SYD.) OF AONLA (*EMBLICA OFFICINALIS* GAERTN.)

Sanjeev Kumar*, Pradip Kumar, Prashant Mishra, Santosh Kumar and Sukhvindar Singh

Department of Plant Pathology, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad - 224 229 (U.P.), India.

Abstract

Indian goosberry (*Emblica officinalis* Gaertn) commonly known as aonla is one of the important fruit crop in arid and semi-arid growing regions. To test the effect of bioagents and fungicide alone and in combination against aonla rust, a field experiment was conducted at Main Experimental Station Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad during 2010-2013. The result showed that minimum PDI (9.16) with maximum PDC (74.25) and yield 104.75 kg/tree was recorded with (0.2%) chlorothalonil treatment followed by 1% *T. viride* + 0.1% chlorothalonil (14.40 PDI), (59.52 PDC) and yield 91.31 kg/tree. Bio-agents *Trichoderma viride* & *Pseudomonas fluorescens* were found less effective to control the disease.

Key words : *Emblica officinalis*, aonla, *Ravenalia emblicae,* rust, fungicide, bioagents.

Introduction

Aonla (*Emblica officinalis* Gaertn) is an important indigenous fruit of India. The commercial cultivation of aonla is expended from the "Home Land" of Uttar Pradesh to almost all the states of India including Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Jharkhand, Chhattisgarh and Andhra Pradesh. Among the diseases, aonla rust (*Ravenalia emblicae*) is a serious and economically important disease not only in Uttar Pradesh but also in other states like Rajasthan, Andhra Pradesh, Tamil Nadu, Haryana etc. It was first observed in Rajasthan by Tyagi (1967). In India, Rawal (1993) has observed that this causes considerable loss in major aonla growing tracts of Uttar Pradesh, India. The disease is characterized by appearance of brown pustules on lower side of older leaves of new graft which are brown, circular and raised. On fruits, initial few brown to black pustules appear which develop in the ring. At later stage pustules join together and cover big area of the fruits (Tyagi and Pathak, 1988; Jat and Goyal, 2004). Plants with a severe attack on fruits show no symptoms on the leaves and vice-versa (Tyagi, 1967). Owing to expansion of aonla orchards, working out of management strategies is also equally important to sustain the yield and quality of aonla fruits and hence the present study was conducted to the effect of environment, test of different bio-agents, fungicide alone and in combination with following objectives.

- Symptomatological study under natural condition
- Management with fungicide and bio-agents

Author for correspondence : E-mail: drsanjeev44@gmail.com

Materials and Methods

A field experiment was conducted on cultivar Chakaiya at Main Experimental Station, Horticulture, Narendra Deva University of Agriculture & Technology, Faizabad in Randomized Block Design with three replications during the year 2010-2013. For the management of aonla rust with fungicide and bio-agents, ($\mathbf{T_1}$ = 1% *P. fluorescens,* $\mathbf{T_2}$ = 1% *P. fluorescens* 1% + 0.1% Chlorothalonil, $\mathbf{T_3}$ = 1% *T. viride*, $\mathbf{T_4}$ = 1% *T. viride* + 0.1% Chlorothalonil, $\mathbf{T_5}$ = 0.1% Chlorothalonil, $\mathbf{T_6}$ = 0.2% Chlorothalonil, $\mathbf{T_7}$ = Unsprayed) one tree per replication were maintained for each treatment. Three foliar applications were given at 15 days intervals first spray was done just after initiation of disease. The data on the development of rust on aonla fruits were recorded on the four marked fruiting branches per plant. Disease fruits were graded into six categories of disease incidence *i.e.* 0 = healthy, 1 = 1-10, 2 = 10.1-25, 3 = 25.1-50, 4 = 50.1-75, 5 = >75%. The percent disease index (PDI) and percent disease control (PDC) were recorded

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(6): 1668-1671
Received: 24-08-2020
Accepted: 15-10-2020

CM Gupta
Students, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

Pradip Kumar
Assistant Professor, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

Raja Bhaiya
Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

Anoj Yadav
Students, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author:
CN Ram
Associate Professor, Department of Vegetable Science, College of Horticulture and Forestry Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj Ayodhya, Uttar Pradesh, India

Estimation of direct and indirect association of independent traits with seed yield in bottle gourd (*Lagenaria siceraria* (Mol.) Standl.)

CM Gupta, GC Yadav, CN Ram, Pradip Kumar, Raja Bhaiya and Anoj Yadav

Abstract
An experiment was executed at Main Experiment Station of Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.) during *Zaid* 2019, path analysis among different character. Experimental material for the study consisted of 36 genotypes including two checks (Pusa Naveen and Narendra Rashmi). The experiment was conducted in Randomized Complete Block Design with three replications. Single row plot of 3 m length spaced 3 m apart with 50 cm plant to plant distance was maintained. Observations were recorded on 14 quantitative traits *viz.* days to first staminate flower and pistillate flower anthesis, node number to first staminate and pistillate flower appearance, days to first fruit harvest, green fruit length (cm), green fruit circumstances (cm), mature fruit length (cm), mature fruit circumstances (cm), mature fruit weight(kg), seed weight per fruit(g), number of seed per fruit(g), 100-seed weight(g), seed yield per plant(g). Seed weight per fruit and days to first fruit harvest, node number to staminate flower appearance were identified as most important traits with positive direct effect on seed yield per plant. However, no of seed per fruit and mature fruit weight were found as important indirect contributor towards high seed yield per plant via seed weight per fruit at both phenotypic and genotypic level.

Keywords: path coefficient, direct and indirect, bottle gourd or *Lagenaria siceraria*

Introduction
Bottle gourd [*Lagenaria siceraria* (Mol.) Standl.) is one of the most valuable member of family cucurbitaceae having somatic chromosome number 2n=22. The bottle gourd or white flowered gourd is commonly known as Lauki or Ghiya in India. It is an annual plant with very large leaves and branched tendrils, spreading or climbing up to 15 meters. The study of extent of correlation of various traits with each other is an important strategy designated to break genetic barriers of yield. This study is helpful in determining the components of a complex trait like yield. However, only correlation does not provide an exact magnitude of direct and indirect effect towards the yield. In this context, path coefficient analysis is an important tool to partition the correlation coefficient into direct and indirect effect of the independent variables on the dependent. This information may be useful to breeder in selecting high yielding genotypes in a crop. Keeping this in view, the present investigation was conducted to determine the characters and their direct and indirect effects on yield.

Material and Methods
The present investigation was conducted during *Zaid*, 2019-20 at Main Research Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar, (Kumarganj) Ayodhya (U.P.). Narendra Nagar is situated at 26.470N latitude and 82.120E longitude at an altitude of 113 metres above the mean sea level. The soil type of experimental site was sandy-loam. The experiment was laid out in completely Randomized Block Design with three replications on March 4th, 2019. Each genotype was planted in 3m x 3m plot size. The distance between rows and plants was kept at 3m and 50cm, respectively. Six plants were maintained in each plot. The recommended agronomic practices were followed to raise a good crop. Observations were recorded on six randomly selected plants from each replication on 14 quantitative traits such as days to first staminate flower and pistillate flower anthesis, node number to first staminate and pistillate flower appearance, days to first fruit harvest, green fruit length (cm), green fruit circumstances (cm), mature fruit length (cm), mature fruit circumstances (cm), mature fruit weight(kg), seed weight per fruit(g), number of seed per fruit(g), 100-seed weight(g), seed yield per plant(g). The data were subjected to analysis of variance as per the procedure described by Panse and Sukhate (1967).

© 2019 IJRAR May 2019, Volume 6, Issue 2 www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138)

"FAULT DIAGNOSIS AND REMEDIES C ROTATING MACHINES"

[1]Satyendra Singh Kuntia, [2]Ram Bahadur Singh, [3]Seema
[1]M. Tech Scholar, [2&3]Guest Faculty
[1]NIT Bhopal, [2&3]Mahamaya College of Agricultural Engineering & Technology Ambedkar Nagar (UP), India

Abstract: It is natural for a machine to vibrate. Nowadays, machines used everywhere in the industry. By using the specific way, the vibration data can be collected, the data can be very useful to control the behavior of machines. This thesis presents the way of collecting the vibration signals from different rotating machines by using condition monitoring tools. Machine fault diagnosis in machines has been a key concern for which many methods have been devised such as Fast Fourier Transform (FFT) band spectrum analysis, Signature analysis. Shaft misalignment, rotor unbalance and bearing fault are the main sources of vibration in rotating machines. These methods may be useful for large systems like in turbine shafts, gearboxes, induction motors and the like. Such a method has enormous potential in are automated diagnostics process whereby the measurement of the responses, the fault condition and location can be detected. In present work, Fault diagnosis by employing vibration signals is done. Vibration signals data obtained from spectrum analysis has been carried out for finding different parameters of machines such as velocity, acceleration etc. The vibration parameters are computed from spectrum, and analyzed the effect of vibration on health of machines.
Index Terms – Fault Diagnosis, Fast Fourier Transform, Signature Analysis, Condition Monitoring.

1. Introduction

Condition monitoring is the method to determine the condition of machinery while in operational. The key to a useful condition monitoring techniques includes:
i. Knowing what to concentrate for.
ii. A way to interpret it.
iii. When and how to put this knowledge to use.
Successfully using these techniques permits the repair of downside elements prior to failure. Condition monitoring not only helps plant personnel decrease the possibility of catastrophic failure, but also allows them to order parts in prior, schedule manpower, and plan other repairs during the downtime period. According to Maintenance Resources, the development of condition monitoring technique can be divide into three generations ranging from the 1930s to the 1980s and up to recent time. During the primary generation of evolution, through '30s and '40s, most industrial machinery was comparatively basic and there was not as much focus on failure. In addition, because these tools were less complicated, repairs were relatively easy, carried out in faster way, fixes taking place in establishments these days. As equipment's became more sophisticated and complicated, organizations became increasingly dependent on their industrial machines. This allows the initiations of the second generation of machine monitoring from the decades of '50s to '70s. During this time, experts made condition monitoring a higher priority and efforts to decrease failure became more prominent. Then, during the third generation that ranges from the '80s till now, machine reliability became a prime focus within any industry that counts on the availability of large equipment's. As such, when equipment now-a-days suffer breakdowns and failure, it can affect the overall process and operation of a industry. Whole time Reliability stated that machine monitoring presently fulfills a variety of purposes within industries, including acting a means to find changes in machinery condition, as well as providing opportunities for predictive maintenance. Additionally, experts these days utilize these methods to find impending failures and determine methods to mitigate these unnecessary breakdowns. Meanwhile, it is important to note that condition monitoring does not by itself prevent catastrophic failures, as the methods only detects and predicts them. Experts and employees must take action based on to data leveraged from machine monitoring systems to avoid failure.

1.1 FFT Analysis

The Fast Fourier Transform is an algorithm optimization of the DFT—Discrete Fourier Transform. The "discrete" part just means that it's an adaptation of the Fourier Transform, a continuous process for the analog world, to make it suitable for the sampled digital world. Most of the discussion here addresses the Fourier Transform and its adaptation to the DFT. When it's time to implement the transform in a program, will use the FFT for efficiency. The results of the FFT are the same as with the DFT; the only difference is that the algorithm is optimized to remove redundant calculations. In general, the FFT can make these optimizations when the number of samples to be transformed is an exact power of two, for which it can eliminate many unnecessary operations. From Fourier we know that periodic waveforms can be modeled as the sum of harmonically-related sine waves. The Fourier Transform aims to decompose a cycle of an arbitrary waveform into its sine components; the Inverse Fourier Transform goes the other way—it converts a series of sine components into the resulting waveform. These are often referred to as the "forward" (time domain to frequency domain) and "inverse" (frequency domain to time domain) transforms. For most people, the forward transform is the baffling part—it's easy enough to comprehend the idea of the inverse transform (just generate the sine waves and add them). So, will discuss the forward transform; however, it's interesting to note that the inverse transform is identical to the forward transform (except for scaling, depending on the implementation). One can essentially run the transform twice to convert from one form to

© 2019 IJRAR March 2019, Volume 6, Issue 1 www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138)

EFFECT OF CRYOGENIC HEAT TREATMENT ON MECHANICAL PROPERTIES AND MACHINABILITY OF TOOL STEEL D3

[1]Dharmendra Kumar, [2]Ram Bahadur Singh, [3]Seema
[1] Asst. Professor, [2&3] Guest Faculty,
[1]MCS Group of College Lucknow, [2&3]MCAET, Ambedkar Nagar, (UP), India.

Abstract: This paper evaluates the resultant effects of Cryogenic heat treatment on machinability properties of cutting tool on material Tool Steel D3. Mechanical property changes before and after Cryogenic heat treatment are compared. Result of tool wear & chip morphology are measured with different machining factors and magnified and compared through scanning electron microscopy technique. Optimum setting for cutting speed and feed rate are is determined using Response Surface Method Technique. Machining properties are enhanced for tool and are better when compared to conventional machining process results.
Index Terms – Machining, Cryogenic Heat Treatment, Tool Steel D3.

1. Introduction

Tool steel is used to prepare cutting tool for dies and mold preparation and other materials. There are different classifications for tool steel based on specific grate and composition. Tool steel has different properties for different compositions. These properties can also be improved with Heat treatment. Cryogenic heat treatment is one specific process which brings out the improved properties when compared to that general heat treatment.

In heat treatment process, many process are used one by one such as heating process, annealing process, cooling process and hardening process etc. sometime one more type of treatment process is used in heat treatment process which one is cryogenic treatment, sometime cryogenic process work as additional process and sometime cryogenic process work separately. Cryogenic treatment process is latest treatment process of material in which material is cooled to very low temperature up to 77K and many gases are used in cryogenic treatment process such as nitrogen, oxygen, neon, hydrogen, helium, carbon die oxide etc. nitrogen gas is most widely used in cryogenic treatment process because nitrogen gas can reach to -196 °C (77K) but if we want temperature up to -268 °C (5K) then neon gas is used because 5K temperature cannot be obtain by use of nitrogen gas. Cryogenic treatment process relieve internal stress/internal crack of material.

1.1 Cryogenic Heat Treatment

Cryogenic treatment modifies the properties of metal by use of cryogenic temperature and change the crystal structure of material. Cryogenic treatment process works on third law of thermodynamics. Thermodynamics third law states that entropy at absolute zero temperature is zero, cryogenic treatment follow this principle for relieving the stresses in material. In cryogenic treatment, material is subjected to very low temperature for long time period. Cryogenic treatment do not substitute the heat treatment process, it is additional process for tool steel. Hardness of Most of material does not change by use of cryogenic treatment therefore we need to Tempering before cryogenic treatment to gain toughness and hardness of material and it affect the entire material.

1.2 Classification of cryogenic treatment

Cryogenic treatment process is mainly divided into two parts which depend on the temperature such as

(i) Shallow cryogenic treatment (SCT)

(ii) Deep cryogenic treatment (DCT)

In shallow cryogenic treatment, tool steel keep at almost 190K temperature then brings to room temperature while in deep cryogenic Treatment, tool steel keep at almost 70K temperature then brings to room temperature. During the conventional heat treatment, we cool the materials till room temperature and then some austenite leave in material. Then this retained austenite is transferred into martensite by use cryogenic treatment. Liquefied gases are used in cryogenic treatment such as liquid neon, liquid nitrogen, liquid helium etc. nitrogen gas is most widely used in cryogenic treatment and easy purchasable in the world. Boiling temperature of gases used in cryogenic (cryogens).

2. Literature Review

Machining of tool steel is difficult problem for any researcher because tool steel D3 is very strong material. After reading the many research paper, I found that strength of insert tool used in turning operation should be higher than strength of material used for machining [1-3]. Many researchers studied on machinability of tool steel D3 but most accurate values are not obtain yet. Therefore my focus is on to measure the roughness of tool steel after and before the heat treatment process, finishing of machining should be best because many tools are manufactured by using the tool steel D3. These tool made by tool steel are used in forming, rolling, punching, piercing, insert tool and other tools. Therefore roughness and strength of tool steel is important to know for any researchers. In this research I focused on roughness, wear of tool and chip morphology [4]. For machining the tool steel D3, turning operation is used. Machining of tool steel D3 can be increased by heat treatment process and some cooling technique [5-8]. And many researchers have complete different experiment to find the tool life in turning operation using CBN insert tool and experiment data are carried out at several cutting parameters. To find the best result of roughness of material, selection insert tool should be proper because improper selection of insert tool

EXPERIMENTAL AND COMPARATIVE STUDY OF COMPRESSIVE STRENGTH OF CONCRETE MADE OF NATURAL AGGREGATE AND RECYCLED AGGREGATE

[1]Seema,[2]Dheeresh Kumar Nayak,[3]Surendra singh parmar,[4]Ram Bahudur Singh
[1]Guest Faculty,[2]Research Scholor IIT BHU,[3]Assistant Engineer,[4]Guest Faculty
Civil Engineering,
[1]Mahamaya College of Agricultural Engineering &Technology ,AMBEDKAR NAGAR(UP),India

ABSTRACT

In this study compressive strength of concrete produced using recycled aggregate and concrete produced using natural aggregate has been compared. The recycle aggregate is obtained after crushing already cast concrete cube in the laboratory. After crushing the aggregate has been run in L.A. abrasion machine for 6 minutes or 200 rounds with 12 iron balls inside it. This process removes sand and cement which are attached with the aggregate after the crushing. The obtained aggregate has been passed through a sieve to remove sand and cement. Now the aggregate is washed with water,so that remaining sticking materials also removed from the aggregate.

The properties of recycled aggregate are different from natural aggregate like specific gravity, water absorption etc. Using a laboratory test method these properties of recycled aggregate is determined. As water-cement ratio effect the compressive strength of concrete so cube has cast at six different water-cement ratio. Concrete cube has been cast with use of recycle aggregate with six different water-cement ratio as .5, .475, .45, .425, .40 and .38. Concrete cube of natural aggregate has been cast with three different water-cement ratios as .5, .45 and .40. Concrete cube tested on 7, 28 and 60 days. Comparison of compressive strength of concrete has been done between concrete cube produced using natural aggregate and concrete cube produced using recycled aggregate.

Key Words:- Recycle Concrete Aggregate, Compressive Strength, Natural Aggregate

INTRODUCTION

Concrete recycling is becoming an increasingly popular way to utilize aggregate left behind when structures or roadways are demolished. In the past, this rubble was disposed of in landfills, but with more attention being paid to environmental concerns, concrete recycling allows reuse of the rubble while also keeping construction costs down.

Several advances have made recycling more economical for all types of concrete pavements in recent years. These include:

1. Development of equipment for breaking concrete pavements be they plain, mesh-and-dowel or continuously reinforced.
2. Development of methods to remove steel that minimizes hand labour.

Use and application of crushing equipment that can accommodate steel reinforcement.

Recycle Concrete Aggregate (RCA) is the main components of old concrete and for many reasons, there is a need to re-use them. It is better to the reuse of waste aggregates as recycled aggregates in structural concrete, instead of throwing out as a total waste material. Thus in recent years, the use of recycled concrete aggregate has gained tremendous momentum in constructional engineering. Utilization recycling of waste concrete would benefit into two folds. First, reduce the environmental problem and second reduce the utilization of natural resources. By the production and use of RCA, these advantages include lower environmental pollution, reduction in valuable landfill space, and savings in natural aggregate resources.

Demolition of old and deteriorated buildings and traffic infrastructure, and their substitution with new ones is a frequent phenomenon today in large part of the world. The main reasons for this situation are changes of purpose, structural deterioration, rearrangement of a city, expansion of traffic directions and increasing traffic load, natural disasters (earthquake, fire and flood), *etc.* For example, about 850 millions oftones of construction and demolition waste are generated in the EU per year, which represent 31% of the total waste generation [1]. In the USA, the construction waste produced from building demolition alone is estimated to be 123 million tons per year [2].

LITERATURE REVIEW

In 1978 **P.J. Nixon** presented a review report on recycling concrete aggregate (RA) also known as the first state of the art development. In this review he mentions various work done on recycle concrete aggregate between 1945-77. **Gomezinvestigates** the use of waste concrete as an aggregate in Russia in 1946. He found out RA has a lower specific gravity and lower compressive strength as compared with the natural aggregate(NA). At equal compressive strength, the flexural strength of RA is greater than

"STABILITY OF WASTE DUMP: SLOPE STABILITY ANALYSIS"

[1]Seema, [2]Ram Bahadur Singh, [3]Dheeresh K Nayak,[4]Rakesh Babu Gautam,[5]Akash Deep Gupta
[1]Guest Faculty, [2]Guest Faculty, [3]Research scholor IIT BHU,[4]Assistant Professor,[5]Guest Faculty
Civil Engineering,
1Mahamaya College of Agricultural Engineering &Technology,AMBEDKAR NAGAR(UP),India

Abstract : Open dumping is the most usually utilized strategy received in India as strong waste administration. In any case, slant disappointments of open dump destinations lead to ecological contamination as the vast majority of the open dumps are situated close water bodies. Hence, breaking down the steadiness of open dumps is vital in executing mitigatory estimates where required. Wilderness bahadur ali open dump site which is situated close Mahesra, Gorakhpur (U.P.), India was considered as a contextual investigation to examine the dependability of its inclines comprising of old and new waste speaking to various degrees of deterioration. Shear quality parameters of the waste examples of the old and new waste destinations were resolved utilizing box tests at various profundities with molecule measure under 9.5 mm. Explicit gravity test, Oedometer test and Standard Proctor compaction test were performed to get Gs, essential and auxiliary solidification parameters, most extreme dry thickness and the ideal dampness content. Furthermore, direct shear test was completed to decide the shear quality parameters of the fill. Slant strength examination was done utilizing Slope/W and Plaxis-2D programming considering Mohr Coulomb and delicate soil creep models separately for waste material. Thought of essential and auxiliary combination settlement inside the landfill in the Plaxis-2D investigation brought about an expansion in the Factor of safety (FOS). Along these lines, FOS esteems acquired from the incline soundness investigation of the old site, was higher than that in the new waste si.

Index Terms – Open dumping, Solidification, Dampness

I. Introduction

Metropolitan strong waste is a kind of strong waste created from network, business and agrarian tasks. This incorporates squanders from families, workplaces, stores, enterprises and other non-fabricating exercises. City strong waste evacuation is a noteworthy issue in everywhere throughout the world. There are a few techniques accessible to expel strong squanders, for example, designing landfill, open dumping, reuse and reuse and sea dumping. Truly, landfills have been the most widely recognized technique for sorted out waste transfer and remain so in numerous spots the world over. A few landfills are likewise utilized for waste administration purposes, for example, the impermanent stockpiling, solidification and exchange, or preparing of waste material (arranging, treatment, or reusing). An open dumping is characterized as a land transfer site in which strong waste is discarded in a way that does not secure nature and helpless to open copying, presented to the components, scroungers, and so forth. There have been various landfill disappointments on the planet with high loss of lives and properties. Dependability of an incline is assessed by the equalization of shear pressure and shear quality. A formerly steady slant might be influenced by numerous components, making the slant unsteady. Activating elements of an incline disappointment can be a climatic occasion that can make a slant flimsy prompting mass developments. Mass developments can be brought about by increment in shear pressure, for example, stacking, parallel weight and transient powers. Then again, shear quality might be diminished by enduring, changes in pore water weight and natural material. In slant solidness examination, essential trouble with investigation is finding most likely slip plane for some random circumstance, on the grounds that the vast majority of the disappointment cases are dissected after the genuine disappointments. In any case, these days slant observing utilizing radar innovation has been utilized. Steadiness can be altogether improved by introducing seepage way to lessen the destabilizing powers.

On the off chance that the open dump locales experience disappointments they can influence adjacent water assets. There are number of landfill disappointments happened in world with high loss of lives and properties, for example, landfill disappointment happened in Ohio, USA on ninth March, 1996, Landslide at the Payatas dumpsite, Philippines on eleventh July 2000 (Jafari et al.2013, [7]), Hiraya avalanche in Iran on 1997. There are no slant disappointments in open dumpsites experienced in Gorakhpur (U.P.), India, yet the vast majority of them are situated close waterway banks. Consequently, investigating the solidness of this landfill is essential. In this exploration, a civil strong waste landfill site at Jungle bahadur ali is considered as a contextual investigation. This site is nearby the "Rapti River". It for the most part comprises of two particular regions, for example, new site and old site. Old site comprises of MSW dumped at beginning periods of its activity and the new site comprises of MSW dumped after the old site is completely filled. Following couple of long stretches of activity dumping of MSW was ceased and the whole site was relinquished. These two destinations comprising of MSW which have experienced distinctive level of disintegration are at risk to experience slant disappointment which could prompt extreme ecological contamination for the most part because of its nearness to the stream. Along these lines, the exploration point is to assess the dependability of the slants of old and new destinations joining the spatial variety of shear quality properties inside the fill.

1.2Specific Objectives:

The primary objective of this project is to evaluate the stability of the slopes constructed due to dumping of the waste materials (especially the sub-grade materials). It has the following specific objectives:

- Critical review of the available literature to understand the issues involved.
- Collection of samples from field or an operating mine.
- Analysis of the samples to find out parametric variations (as the cohesion, angle of friction, density, moisture content, grain sizes, etc.) affecting the stability.
- Prediction of safety factor based on the geotechnical data.

Design and development of self-propelled onion (*Allium cepa* L.) digger

VISHAL PATEL[1], DHARMENDRA KUMAR[2] and ANSHU SAXENA[1]

[1]Department of Farm Machinery and Power Engineering, College of Technology, G. B. Pant University of Agriculture and Technology, Pantnagar-263145 (U.S. Nagar, Uttarakhand), [2]Indian Institute of Technology Kharagpur-721302(West Bèngal)

ABSTRACT: In this study, an effort has been made to design and develop an onion digger for the onion field in India. The onion digger has four wheels and a two-wheel drive machine. The digging system consists of a blade made up of high carbon steel material (EN45), which was the central digging part of the machine having dimensions 1000mm*250mm*10 mm. Fingers of the reaper binder are also provided to protect the blade from obstacles like heavy rocks and tough metals. The spacing of fingers is 180 mm, and the width of each finger is 100mm. Fingers are fastened on the blade with the help of nuts and bolts, and they are easily replaceable when got damaged. The forward operating speed of the machine is 3-5 km/h, and the maximum speed is10 km/h, having a field capacity of 0.2 hectares per hour. The working depth of the machine is 100mm. Depth is suitable for the field with practically no damage to the onion bulb. The fuel consumption of the machine is 3.5 litres per hour when working at full capacity.

Key words: Digger, development, farm machinery, onion harvester

India is the second-largest onion-producing country in the world (Kumar *et al.*, 2006). Indian onions are available round the year and have two seasons, first harvested from November to January and the second harvesting from January to May. The onion is a biennial but is usually grown as an annual crop. The bulb can be white, yellow, or red and require 80 to 150 days to reach harvest. The optimum time of harvesting is one week after 50% of leaves have fallen. Onions of an early harvest maturity had a higher storability than other maturities of harvest (Maw *et al.*, 1997). Maturities symptoms include yellowing of leaf and dry at the top; bulbs turn red and attain their optimum varietal size (Talokar *et al.*, 2014).The onion root system is fibrous, spreading just beneath the soil surface to a distance of 45cm (Al-Jamal *et al.*, 2001). In India, most of the onions are harvested manually, and it is a time-consuming and labour-intensive job. When producing bulb onions from sets, the cost of manual labour on tending, harvesting, and postharvest treatment amount to 60–70% in the production cost structure (Laryushin and Laryushin, 2009). Matured bulbs are harvested by hand shovel (khurpa), which requires 21.4 % of the total expenditure of onion cultivation (Kawale and Ramappa, 2019). A lot of research has been done in the past to develop machinery for the harvesting of onions in India as well as in other parts of the world. In this study, an effort has been made to develop a self-propelled onion digger suitable for the Indian field.

MATERIALS AND METHODS

The onion digger was developed for digging the onion between the tyres of the machine, the track width of the machine is 1560 mm, and the width of the blade is 1000 mm. The inclination of the blade was kept between 15-20° for better penetration (Kanafojski and Karwowski, 1976), the angle between 15-20° is best for cutting soil with less resistance. The angle of the blade is adjustable, it can be adjusted by two nuts and bolt assembly. After the blade, there is a conveyor that conveys the dug onion and removes the extra soil. After conveying, onions are dropped on the soil and later pick-up by the labour easily.

COMPONENT OF MACHINE

ENGINE: For providing power to the digger, we use the Kirloskar CC418, 8-horse power Diesel Engine. Air-cooledengine works in the clockwise direction. A single-cylinder internal combustion engine is with

ıternational Journal of Communication Systems / Volume 34, Issue 8 / e4764
ESEARCH ARTICLE

:SS-IBAA: Efficient, short, and secure ID-based authentication algorithm for vireless sensor network

hivendu Mishra ✉, Ritika Yaduvanshi, Kumkum Dubey, Prince Rajpoot

irst published: 11 March 2021
ıttps://doi.org/10.1002/dac.4764

Summary

Designing an efficient, short, and secure authentication algorithm for resource-constrained sensor nodes of wireless sensor networks (WSNs) is a challenging task. Authentication in WSNs is mainly performed by the digital signature algorithm. In this paper, we propose an efficient, short, and secure pairing computation-free ID-based authentication algorithm (signature scheme) ESS-IBAA for WSNs which completely follows the rule of identity-based cryptosystem. Identity-based schemes, unlike traditional public-key infrastructure (PKI)-based schemes, remove the need for public-key certificates for public-key validation. It also removes extra costs associated with the public-key certificate and traffic management. Further, due to the requirement of low power and fast authentication, bilinear pairing computation-free identity-based signature schemes are applicable in WSNs. Keeping this in mind, ESS-IBAA scheme is proposed, which is pairing computation free and uses a general cryptographic hash function in the place of a costly map-to-point hash function. The proposed scheme ESS-IBAA is secure against existential forgery on adaptive chosen message and ID attack in the random oracle model under the hardness of the elliptic curve discrete logarithm problem (ECDLP). Moreover, comparative performance analysis shows that the proposed scheme ESS-IBAA is much more efficient in both communication cost and computation cost from the existing related schemes.

Open Research

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ∋ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9415

A COMPARATIVE ANALYSIS OF PRESSURE AND SPEED ON VOLUMETRIC EFFICIENCY AND DISCHARGE OF THE RECIPROCATING PUMP

Dr. Rajat Kumar Mehta[1], Dr. Harishchandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar nagar, Uttar Pradesh, India[6]

Abstract: The experiment conducted at Mahamaya College of Agricultural Engineering & Technology, Ambedkarnagar (U.P.). The pump tested for analysis performance is ELGIMACE model no. LLO3022 single acting reciprocating pump equipped with 2HP three phase induction electric motor with 1440rpm. A hose measuring of water source of 4.12x3.25x1.23. G.I.20 mm size, suction pipe was used. The delivery pipe was high density pliable reinforced rubber pipe to withstand abundant pressure (up to 25kg/cm^2.). Stop watch was measuring discharge of 1/100sec. of least count. For three different speeds of 242 rpm, 285 rpm and 344 rpm with five dissimilar pressures are 1.5 kg/ cm^2, 5.7 kg/cm^2,10.3kg/cm^2, 15kg/cm^2 and 24kg/cm, pump was tested. Track record of all pipe pressure used for this testing was measured by a pressure gauge having adequacy 0-35kg/cm. In motor shaft a V(twin) belt the electric connection was energized and a pulley with minimum diameter 6.25cm was fitted. The outcomes based on the exploratory observation showed that the efficiency rises when pressure is rises. At speed of 344 rpm the efficiency is detected 90% and at dupe speed the volumetric efficiency is 77% for least pressure 1.5kg/cm and volumetric efficiency is 95% for maximum pressure 24 kg/cm^2. The discharge increases as pressure goes up and it is showed by the average discharge and pressure, which is almost linear. The relationship sequence is mostly same for all above circumstances; this stated that discharge is mutual to the pressure for a reciprocating pump.

Index Terms: Discharge, Efficiency, Volumetric efficiency, Pressure, rpm, Static head, Reciprocal and Pressure head.

I. INTRODUCTION

Reciprocating pump is a pneumatic machine which gets converted in hydraulic energy from mechanical energy. A cylinder containing a reciprocating piston absorbs liquid which expend a thrust (impel) force on the liquid and hike its hydraulic energy (pressure energy of liquid). It's a kind of positive displacement pump which comprises of piston or plunger. It is used at a place where relatively small amount of water is to be delivered at high pressure. Water in cylinder is displaced by the movement of piston for the functioning of reciprocating pump. Valves control the flow. A piston or plunger is cylindrical piece which moves backward and forward inside hollow cylinder. Reciprocating pump's capacity depend on the sizes of cylinder chamber, piston length and piston stroke. Electric motor engine operate a pump which have to come into prominence in a large lift irrigation schemes, high output levels can be quickly attained and managed by this process. Reciprocating pump generates high head, but their capacity is smaller compared to other types of pump. Reciprocating pump works on single acting independent suction and discharge strokes works on double acting suction and they discharge in both the direction. Although, recommendation of specific purpose pumps is very tough due to the inaccurate figures about scientific information such as efficiency discharge, head relation and other characteristics .Understanding all this circumstances, under laboratory conditions a study was approached for evaluation of volumetric efficiency, pressure discharge relationship and speed-power-discharge.

©IARJSET This work is licensed under a Creative Commons Attribution 4.0 International License

B. Patel[1], M. Singh[2], P.K. Mishra[3*], G.S. Manes[2] & M.K. Patel[4]

[1]*Department of Farm Machinery and Power Engineering, Chaudhary Charan Singh Haryana Agricultural University, Hisar, India*
[2]*Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India*
[3]*Department of Farm Machinery and Power Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, India*
[4]*Council of Scientific and Industrial Research, Central Scientific Instruments Organisation, Chandigarh, India*

A prototype of an electrostatic nozzle was developed for spraying cotton crops in a project titled 'Design and development of an electrostatic nozzle for agricultural applications'. The study was carried out to evaluate the locally-developed electrostatic nozzle and compare its performance with an imported electrostatic nozzle and solid cone nozzle (conventional knapsack sprayer) in the cotton crop at the departmental research farm of Punjab Agricultural University, Ludhiana, India. Different spray performance parameters, *i.e.* number median diameter (NMD), volume median diameter (VMD), uniformity coefficient, droplet density, the volume of spray deposition, and area covered with droplets were determined with the help of water-sensitive paper (WSP) method of deposition collection. There was comparatively less variation in uniformity coefficient with the imported and locally-developed electrostatic nozzles than the solid cone nozzle at a 5 % level of significance. The average droplet density obtained with both the imported and locally-developed electrostatic nozzles was significantly more compared to the solid cone nozzle. The area covered by the droplets of the locally-developed prototype of the electrostatic nozzle was more than the solid cone nozzle. The volume of spray deposition differed significantly for all three treatments at a 5 % level of significance. Overall, there was no significant difference in the performance of both electrostatic sprayers, but they were found to be more effective than the solid cone nozzle.

Key words: electrostatic nozzle, uniformity coefficient, droplet density, volume of spray deposition.

INTRODUCTION

Cotton is one of the most important textile fibres in the world, accounting for about 35 % of the total worldwide fibre usage. It is the single most cash crop that is cultivated extensively throughout the world. India, China and the United States of America are the major cotton-producing countries and together account for approximately two-thirds of total world cotton production (Anon 2015a). India is the largest cotton-producing country in terms of total production with an average of 6.10 Mt per year on a total sown area of 11.8 Mha. However, it has the 33rd ranking in the world in terms of yield per hectare because of a low average yield of about 517 kg/ha as compared to the world's average of about 566.27 kg/ha (Anon. 2015b).

Although cotton production and yield increased by introducing new crop varieties and production practices, still significant yield loss was observed as 4.1, 6.5, and 8.8 % in the cotton crop in three districts of India, namely Firozpur, Mansa, and Bathinda, respectively (Dhawan *et al.* 2008). Crop loss due to different insects has been reported to run to 18.0 to 50.0 % (Dhaliwal *et al.* 2010). In an another study the range of yield loss due to cotton leaf curl virus disease was reported to be from 81.4 to 88.4 % in all northern cotton-growing states of India (Monga 2014, as cited in Kumar Sain *et al.* 2019)

There are several spraying methods to protect crops from pests and diseases. Based on the volume application rate, there are three types of sprayers: high volume sprayer, low volume sprayer, and ultra-low volume sprayer. The high volume sprayer leads to loss of spray due to the larger size of droplets and more liquid application

*Author for correspondence. E-mail: pramod.btag@gmail.com

Received 5 November 2020. Accepted 30 August 2021

ISSN 1021-3589 [Print]; 2224-8854 [Online]
DOI: https://doi.org/10.4001/003.029.0471

©Entomological Society of Southern Africa

Article AR2223

DOI: HTTPS://DOI.ORG/10.23910/1.2021.2223

International Journal of Bio-resource and Stress Management

Crossref

Print ISSN 0976-3988

Online ISSN 0976-4038

June 2021

IJBSM 2021, 12(3):216-221

Research Article

Natural Resource Management

Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors

A. D. Gupta*, Ashish Gupta, P. K. Mishra, Yashi Gupta and R. K. Mehta

Dept. of Mechanical Engineering, Acharya Narendra Deva University of Agriculture and Technology, Kumrganj, Ayodhya, Uttar Pradesh (224 229), India

Open Access

Corresponding Author

A. D. Gupta

e-mail: ct40964p@gmail.com

Citation: Gupta et al., 2021. Optimization of Inclination Angle of Cavity and Characteristics of Attached Fins on the Absorber for Performance Enhancement of Solar Collectors. International Journal of Bio-resource and Stress Management 2021, 12(3), 216-221. HTTPS://DOI.ORG/10.23910/1.2021.2223.

Copyright: © 2021 Gupta et al. This is an open access article that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

Conflict of Interests: The authors have declared that no conflict of interest exists.

Abstract

This research investigation was undertaken in ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India to study the numerical optimization of natural convection heat suppression in a solar flat plate collector with straight fins. Optimal characteristics of an array of thin fins attached on the absorber plat were obtained by Particle Swarm Optimization algorithm (PSOA). Free convection considered dominant in the cavity. Governing equations contained continuity; momentum and energy are discretized by finite volume method. The medium is considered incompressible, whose free convection is dominant and Boussinesq approximation is applied. A simplified model of real systems is applied with free convection. Free convection problem is solved by SIMPLER algorithm. Two confined cavities with aspect ratios 30 and 60 are considered as flat plate solar collectors. The results indicate that significant reduction on the free convection heat loss can be obtained from solar flat plate collector by using plate fins, and an optimal plate fins configuration exit for minimal natural convection heat loss for a given range of Rayleigh number. Reduction of up to a maximum of 25% at 0 inclination angle was observed in aspect ratio 30. Results showed PSOA is able to obtain characteristics of attached adiabatic fins on the absorber plate also it can obtain optimal inclination angle of cavity to decrease heat losses from solar collectors. The results obtained provide a novel approach for improving design of flat plate solar collectors for optimal performance.

Keywords: Particle swarm optimization algorithm, solar collectors, natural convection

1. Introduction

Flat plate solar collectors are technique to utilizing solar energy. The flat plate absorbs incoming solar radiation and converts it in to heat and also transfers this heat to a fluid flow. Glazing cover plate prevents from heat loss by force convection but when temperature difference between flat plate and glazing cover plate exceeds to a critical value, natural convection will exist between absorber and cover plate. In present work of heat loss from absorber plate is reduced by investigating optimal characteristics of an array of thin fins are considered. Grossman et al. (1977) expanded a model for heat transfer in a flat plate solar collector with a rectangular channel for water or air fluid flow. The analysis was performed for temperature and heat flow distributions in both dimensions of the collector to investigate the thermal boundary layer development. Overall efficiencies are calculated for uniform solar

Article History

RECEIVED on 26th March 2021 RECEIVED in revised form on 28th May 2021 ACCEPTED in final form on 22nd June 2021

International Journal of Professional Development
Vol.8,No.1,Jan-June 2019 ISSN: 2277-517X (Print), 2279-0659 (Online)
Impact Factor: 2.118(IFSIJ)

SIMULATION MODELLING OF SOLAR DRYING SYSTEM

Arun Kumar
Scientist, CCS Haryana Agricultural University, Hisar

Y.K. Yadav
Scientist, CCS Haryana Agricultural University, Hisar

Mukesh Kumar
Scientist, CCS Haryana Agricultural University, Hisar

Kapil
Corresponding author and freelance Agricultural Engineer
Email:singlakapil1981@rediffmail.com

Pramod Kumar Mishra[3]
Assistant Professor, MCAE&T, NDUAT, UP

Abstract

The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry at various operating conditions. Commercialization of any drying technology for agro-processing or industrial use needs thorough performance prediction and evaluation of system in techno-economic perspectives.

Estimation of solar radiation at Hisar with the help of ASHRAE model has been in close agreement with the observed values taking 5% as level of significance. Thus the model can safely be used to predict isolation at Hisar. The calculated efficiency of the flat plate solar collector using the data at different point in the solar dryer during testing has been consistent.

Introduction

Drying is one of the essential unit operation performed to increase the shelf life of agricultural / horticultural produce and it is one of the most practical methods of preserving food and the quality of horticultural produce. Use of proper drying techniques can significantly reduce the post-harvest losses of fruits and vegetables (Attkan and Alam, 2018). There exist many technical problems associated with open sun drying namely cloudiness and rain, insect infestation, high level of dirt and atmospheric pollution and intrusions from animals and men. In addition to this there is no control on the drying process (VijayaVenkata Raman et al., 2012). Hence, developing countries, receiving significant amount of solar radiation must realise the importance of controlled drying using solar energy. Traditional method for fruits and vegetables drying in rural areas in India is to spread the products on the ground with exposure to the sun in the open air. Sun-drying method may be efficient and cheap process but has disadvantages such as contamination by dirt, insects and bacteria and loss due to wetting by rain squirrels (Esper and Muhlbauer, 1998). These are usually accepted as an inherent part of the method of processing. In order to protect the products from above mentioned disadvantages and also to accelerate the time for drying the products, control the final moisture and reduce wastage through bacterial action. Solar energy is fast becoming an alternative source of energy because of the high rate of depletion of the conventional energy sources. It has many advantages over other alternative source of energy such as wind because of its abundant, inexhaustible, renewable and non-polluting nature. Equally, it can be tapped at a relatively low cost. The associated danger of fire or other hazards are less (Ekechukwu and Norton, 1999).

Whereas, controlled solar drying system leads to faster rate of drying and exposure of products against rain, dust, storm, birds, rodents, insects and pests are avoided. This ensures better quality of dried products which would fetch higher prices (Hossain and Bala, 2007). In solar drying method, faster drying takes place which result a significant reduction in drying time. Product dried in solar dryer are superior in quality (colour and flavour). Though the same superior quality product can be obtained by using electricity or electric power, but the electric operations are expensive and are not within the reach of our rural and tribal population. There is also inadequate supply of electricity in rural areas. In such conditions solar-energy crop dryers appear increasingly to be attractive as commercial propositions (Das and Kumar, 1989).

The development of simulation model is a powerful tool for prediction of performance and can help designers to optimize the dryer geometry

Plant Archives Vol. 19 No. 1, 2019 pp. 1358-1362 e-ISSN:2581-6063 (online), ISSN:0972-5210

ENERGY INPUT FOR FODDER CROP PRODUCTIONS UNDER DIFFERENT TYPES OF FARMING SYSTEMS

Pramod Kumar Mishra*, Sunny Sharma, Himanshu Tripathi and Dharmendra Pandey

Lovely Professional University, Phagwara, Punjab, India

Abstract

The pattern of energy utilize in cultivation of fodder crop was studied under traditional and partially mechanized farming system. It was observed that the total operational energy was found to be 6883.83 MJ/ha and 7298.73 MJ/ha in traditional and partially mechanized farming system respectively. Out of which 48.52 and 56.21 percent was utilized by direct source of energy in different farming systems, whereas 51.48 and 43.79 percent was utilized by indirect sources of energy. The total energy cost in traditional farming system was Rs 86450 /ha. Similarly, the cost of energy in partially mechanized system was Rs 93201 /ha. This difference clearly indicates that traditional farming system can be replaced by partially mechanized farming system with more return.

Key word: Partially mechanized farming system Energy ratio, energy productivity etc.

Introduction

Energy is integral part to national development process and to provide major vital services that improve human requirements; fuel for cooking, light for living, motive power for transport, and electricity for modern communication. In agricultural sector, its use is in every form of inputs, seed, fertilizer, agro-chemical for plant protection, machinery use for various operation, housing, transport, and processing. Apart from solar energy, production agriculture uses basic additional energy inputs, soil, water, tractive power, chemicals for growth of plants. The amount of energy invested through these inputs and quantity actually used by the plant govern the crop growth and yield during their life cycle.

Singh *et al.* 202 has estimated that total energy input Indian agriculture increased by 3.6 times. In modern agriculture, commercial energy sources (fuel, machinery and chemicals) contribute bulk of the energy supplies to the production system. Commercial energy use in agriculture has been increasing since revolution with increasing use of diesel and electricity in farm operations. The share of agriculture in electricity consumption has increased from 3.9% of the total consumption in 1950-51 to 29.6% in 1993-94. Total commercial energy use in agriculture increased nearly fivefold with growth rate of 11.8% between 1980-81 to 1994-95. The share of agriculture in total consumption in the country increasing marginally from 3.2 to 5.2% during the same period. Increase in land productivity and efficient diversification of agriculture for better economic return to the producers will call for significantly higher level of input to agriculture (Mahapatra, 1991).

India is presently under heavy stress on account of a large-scale exploitation for fuel wood, timber and fodder, mismanagement of forest resources and frequent fires. There is acute shortage of fodder especially green nutritious fodder, which is major cause of low productivity of livestock, especially in hilly area (Deb Roy *et al.*, 1989). The main reasons for low productivity is insufficient and low quality fodder and feed including grazing facilities (Deb Roy, 1993). Therefore, India has been the home of major draught, milch and dual-purpose breeds of cattle. Indian dairy production system is complex and generally based on traditional and socioeconomic considerations. However, there has been a rapid change in way of agriculture (*i.e.* cropping system, water resources, diversification of crop, intensification of agriculture), increasing use of mechanical power, transformation from

*Author for correspondence :

Vol. 14(4), pp. 24-31, 15 March, 2019
DOI: 10.5897/SRE2016.6411
Article Number: BE06F8560496
ISSN 1992-2248
Copyright©2019
Author(s) retain the copyright of this article
http://www.academicjournals.org/SRE

ACADEMIC JOURNALS

Scientific Research and Essays

Full Length Research Paper

Precision attributes based index for the selection of efficient agricultural machinery

Manjeet Singh[1], Karun Sharma[2*], Pramod Mishra[1], Bharat Patel[1] and S K Singh[1]

[1]Department of Farm Machinery and Power Engineering, Punjab Agricultural University, Ludhiana, India.
[2]Krishi Vigyan Kendra, Samrala, Punjab Agricultural University, Ludhiana, India.

Received 5 May, 2016; Accepted 25 January, 2017

Development and introduction of high capacity, precise, [illegible] and energy efficient machinery/equipment is the need for judicious use of inputs. Manufacturing of agricultural machinery in India is varied in nature and starts from village artisans, tiny units, [illegible] to small scale industries, organized tractor and agricultural machinery manufacturers including energy and processing machinery industry. Precision in application rates for higher input-use [illegible]ency can be achieved only by improving the designs of the existing machinery/equipment. Precision index (PI) of machine/equipment is based on its capability to perform a given [illegible] accurate manner. It is a worthwhile attribute to compare the performance of different equipment [illegible] operations to enhance the productivity of a given farm. The purpose of study was to propose [illegible] that is, PI to select efficient and precise machine/equipment for the farmers. PI values were calculated for three types of machinery namely zero seed cum fertilizer drills, planters and spraying machines. [illegible] concluded that drill Make 2, tested in the year 2004, was having the highest PI value, that is, [illegible] followed by drill Make 1 having PI value 0.95 or 95% tested in the same year. Drill Make 5 [illegible] the year 2013 was having minimum PI value, that is, 0.80 or 80%. PI value for happy seeder [illegible] 0.88 or 88%. During the testing of multi-crop planter in year 2014, the variability of doubling [illegible] was more, that is, 28% followed by missing having 20% value and produced influence on PI [illegible] observed to be 0.83 or 83%. PI of semi-automatic and automatic potato planter was found to be [illegible] 0.80, respectively. The value was not much satisfactory and could be ranked under [illegible]gory. PI of electrostatic sprayer mounted with single as well as twin nozzle was observed [illegible] highest, that is, 0.89 followed by PI of air assisted sprayer with single and double nozzle [illegible] and 0.84, respectively.

Key words: Precision index, zero till seed cum fertilizer drill, happy [illegible]ying machines, planting machines.

INTRODUCTION

Mechanization imparts capacity to the farmers to carry out farm operations, with ease and lesser drudgery. It helps the farmers to achieve timeliness, precisely meter and apply c[illegible] better efficacy and efficiency. Efficient ma[illegible] increasing productivity by about 30% [illegible] besides [illegible] the farmers

*Corresponding author. E-mail: karunluckysharma@gmail.com.

Author(s) agree that this article remain permanently open access under the [illegible] Creative Commons Attribution License 4.0 International License

RESEARCH PAPER | International Journal of Agricultural Engineering | Volume 12 | Issue 2 | October, 2019 | 199-202
ISSN–0974–2662 ■ Visit us : www.researchjournal.co.in ■ DOI: 10.15740/HAS/IJAE/12.2/199-202

Performance evaluation of mahua stamen remover

■ S. K. Pandey, V. Choubey, P. K. Mishra and S. Pandey

Received : 25.07.2019; Revised : 19.08.2019; Accepted : 05.09.2019

See end of the Paper for authors' affiliation

Correspondence to :

S. K. Pandey
Department of Agricultural Engineering, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) India
Email : sushil.pandey999@gmail.com

■ **ABSTRACT :** Mahua stamen remover was evaluated for its performance. It was tested at four moisture levels (11.9, 13.17, 15.64 and 17.66 % d.b.) and three feed rates (15, 21, 27 kg/h). The stamen removal efficiency and whole flower recovery were determined to optimize feed rate and moisture content of mahua flower for better performance of the machine.The present study revealed that the optimum flower moisture content and feed rate were found to be 13.17 per cent and 15 kg/h, respectively with stamen removal efficiency of 88.23 per cent and whole flower recovery of 81.2 per cent.

■ **KEY WORDS :** Mahua stamen remover, Stamen removing efficiency, Whole flower recovery ans deseeder

■ **HOW TO CITE THIS PAPER :** Pandey, S.K., Choubey, V., Mishra, P.K. and Pandey, S. (2019). Performance evaluation of mahua stamen remover. *Internat. J. Agric. Engg.*, **12**(2) : 199-202, **DOI: 10.15740/HAS/IJAE/12.2/199-202.** Copyright@2019: Hind Agri-Horticultural Society.

Mahua *(Madhuca indica)* of Sapotaceae family is a large tree found inthe deciduous forest of India. Every part of the mahua tree is used by the tribals for their livelihood. Its flower is used as foods and can be fermented to alcoholic drinks due to its high sugar content. It is a multipurpose tree providing food, fuel, timber, green manure, oil, oil cake, liquor and raw materials for several products and is one of the most important trees of Indian forest. It also has a religious and a high bio-asthetic value in the tribal culture. It is one of those multipurpose forest tree species that provide an answer for the three major Fs *i.e.,* food, fodder and fuel (Banerji and Mitra, 1996). It is very important from the point of view that it can help inpromoting nutritional and economic security in backward areas.

The estimated annual production of mahua flower is around 2 lakh tonnes (*www. jhamfcofed.com*) in Jharkhand. Mahua tree produces edible flowers and fruits. The ripe flowers, which fall from the tree, are collected. The yield per tree ranges from 100-200 kg. Mahua is also famous for its seed oil.

Mahua flower can be utilized in a variety of ways in home, as animal feed and also as raw material for industrial products. They can be used as a sweetener inpreparation of many local dishes like *Halwa, Kheer, Puri* and *Burfi* (Patel and Naik, 2008). It is also used for preparation of bakery and confectionary goods. Tribal people also use it for brewing alcohol. It contains tannin as tannins are excellent antioxidant that helps in giving the structure, texture and flavour to wine. Mahua flowers are also considered good for cooling and are used as a tonic and demulcent. However, an estimated 90 per cent of the production goes into brewing beverages. Mahua has various types of medicinal uses due to its tannin content. It is used as anti-diabetic, antiulcer, hepato protective, anti-pyretic, anti-fertility, analgesic, anti-oxidant, swelling, inflammation, piles, emetic, dermatological, laxative, tonic, anti-burn, anti-earth worm, wound healing headache and many more problems (Patel *et al.,* 2012). On account of various advantages of mahua

PIPE WATER NETWORK DISTRIBUTIONVERSUS CANAL FOR IRRIGATION - A CASE STUDY OF KHANGAON BRANCH OF LOWER WARDHA PROJECT

[1]SEEMA, [2]RAM BAHADUR SINGH, [3]SHASHI PRABHA ANAN
[1]Guest faculty, [2]Guest faculty, [3]Guest faculty
[1]Civil Engineering,
[1]Mahamaya college of agricultural engineering & technology,Ambedkar nagar, India,

Abstract In This case study of Khangaon branch of Lower Wardha shows comparision and difference in the pipe water distribution system and canal system. Irrigation is a vital input in the agricultural productivity and agricultural growth. More than 70% of available inland water resources worldwide are being presently utilized for irrigation purposes. From the source the water is carried through open channels or close conduits to the irrigation areas. There is no doubt that modernization of irrigation system like concrete lining to the inner surface of the open channel and canal automation etc. will save water. However, still there are significant losses due to theft, evaporation & seepage. Further, contamination of water takes place due to people using water for bathing and cloth washing. On this background it is appropriate to adopt innovative, simple, easy to adopt, water distribution system using pipe lines. The paper discusses the need to adopt pipe line network for water conservation for irrigation projects, and a case study of Khangaon Minor of Lower Wardha project in detail. The findings show that such water distribution network using pipe lines shall be implemented in irrigation projects so as to achieve good water management with high water conservation comparatively with canal by maintaining the proper residual pressure/head and velocity

Key words: Pipe Distribution Network; Water conservation; Water distribution system

I. INTRODUCTION

1. INTRODUCTION

As we progress into the 21st century, water guarantees to be one of our most valuable assets. Insightful administration and legitimate preservation of this asset will be progressively vital, and imaginative strategies should be utilized to spare water. Robotization combined with astute plan has significantly expanded assembling efficiency around the world, while cutting the undesirable and along these lines enhancing the quality. Water system network give important water to agriculturists who have the ability to expand the monetary estimation of water to a decent degree to the extent they can, by legitimate usage of the water. The water from the source to the interest territories can be passed on under gravity through Canal networks or Pipe appropriation networks. These networks have their own points of interest and burdens that may happen amid various phases of structure, examination and development. Canal network is favored over pipe network on financial premise despite the fact that water misfortunes amid progress are high. In any case, considering restricted accessibility of water, expanding cost of land that should be get for canal development, and plausibility of keeping up adequate heads to specifically utilize present day water system strategies like dribble and sprinkler with or without extra vitality, improves pipe dissemination network a decision both as far as in general expense and water use proficiency.

This paper centers about the correlation of canal and pipe networks by choosing certain factors such as residual pressure, land acquisition, water conservation, water quality and total cost of projec. Khangaon part of Lower Wardha Irrigation Project is considered for the investigation. The task was at first intended to be actualized in customary method for canal network. Be that as it may, before execution a substitute is worked out using pipe distribution network. This paper gives a correlation of various parameters in two distinct plans.

2. STUDY AREA: KHANGAON MINOR -1

Figure 1 demonstrates the whole Khangaon minor branch alongside its laterals and chak division proposed. It is situated in Deoli, a residential area and a civil committee in Wardha region in the territory of Maharashtra, India. The investigation territory with scope 20038'35.14" N and longitude 78015'45.94" E is all around associated through State and National highway. The gross direction zone is 555.46 ha, out of which 538 ha is cultivatable order territory. The absolute discharge prerequisite for this zone is determined as 0.295 cumec. The length of the Khangaon Minor-1 without considering the laterals is 6.6

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 4, April 2022

DOI: 10.17148/IARJSET.2022.9435

A REGRESSION ANALYSIS MODEL FOR ESTABLISHING CORRELATION BETWEEN RAINFALL AND GROUND WATER LEVEL FLUCTUATIONS WITH RESPECT TO APPLICATION ASPECTS

Dr. Rajat Kumar Mehta[1], Dr. Harish Chandra Singh[2], Er. Ramjeet Singh[3], Dr. Pramod Kumar Mishra[4], Dr. S.K. Pandey[5], Er. Ashish Gupta[6]

Professor, Deptt. of IDE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[1]

Dean, MCAET, Ambedkar Nagar, Uttar Pradesh, India[2]

Associate Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[3]

Assistant Professor, Deptt. of FMPE, MCAET, Ambedkar Nagar, Uttar Pradesh, India[4]

Assistant Professor, Deptt. of Agricultural Engineering, COA, Kotwa, Azamgarh, Uttar Pradesh, India[5]

Guest Faculty, Deptt. of CS&E, MCAET, Ambedkar Nagar, Uttar Pradesh, India[6]

Abstract: The study was made in order to establish correlation between rainfall and ground water fluctuation of Ambedkar Nagar District in Uttar Pradesh through regression analysis. To study the trend in ground water level in eastern U.P. Ambedkar Nagar a model was fitted known as regression model with data for every year from 2008-2017 .The developed model equation is $Y' = -3.59 \times 10^{-3}X + 13.767810$ .The coefficient of correlation between water table and rainfall was observed as − 0.5735. The result of study had been evaluated through r^2, RMSE and EC were found to be -0.574, 1.23 & 96.6% respectively. The above empirical equation may be useful in prediction of water table depth from rainfall for base line for boring of tube well for timely irrigation of crop.

Index Terms: Rainfall, Regression Analysis, Correlation, Groundwater, Fluctuation.

I. INTRODUCTION

In 1959-60 the area underground water irrigation which is less than six million hectare but went up to 18 million hectare in 1980-81 to 33 million hectares in 1999-2000. More than half of the total irrigation is based on ground water, the share of ground water in area increasing from 30% in 1960-61 to 58.77% in 1999-2000. The area underground water is increasing progressively because it the most reliable and cost effective source of irrigation (Joshi, 2002).

The rainfall contributes to the annual increment in the ground water reserve which in turn is reflected in the rise of water table during the post monsoon period. Estimation of water table is needed for planning and developing the resources. With increasing demand for water for both agricultural and industrial use, the need to develop ground water resources to maximum possible extent has gained importance. The main component of recharge of ground water is precipitation. The ground level is an indicator of ground water availability. Ground water is an important resource of irrigation of India. It contributes to enhance agricultural production was better realize during green revolution and miss management has result in several problem likes fluctuation in water table and increasing in depth of wall. In last 10 year out of total monitoring wells 60% showed depletion in water table depth during per monsoon dry session. This leads to associated problem off lowering tube well depth and drying of open dug wells in the areas. Few areas with associated problem of lowering tube well depth and drying of open dug wells has becomes the major issues. This also indicates the decreasing trend of ground water table depth over a period of time. The fluctuation of water table is mainly depending upon the precipitation received in the area. Being insufficient annual rainfall and which is not sufficient to crop production, it is become essential to have the use of ground water. For irrigation purpose the ground water is utilized through tube well, pumping etc. For installation of the tube well is necessary to know the base the depth of table.

The present investigation entitled to "develop the model for the prediction and relationship between rainfall and ground water fluctuation of Ambedkar Nagar District" was carried out with objective to establish correlation between rainfall and ground water fluctuation.

Int.J.Curr.Microbiol.App.Sci (2020) *9*(10): 1379-1387

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 9 Number 10 (2020)**
Journal homepage: http://www.ijcmas.com

Review Article

https://doi.org/10.20546/ijcmas.2020.910.165

Advances in Sugarcane Peeling Mechanisation

S. K. Pandey[1*], P. K. Mishra[1] and S. K. Pandey[2]

[1]*Mahamaya college of Agricultural Engineering and Technology, Ambedkar Nagar-224122, (ANDUAT, Kumarganj, Ayodhya), India*
[2]*College of Agriculture, Kotwa, Azamgarh, 276001 (ANDUAT, Kumarganj, Ayodhya), India*

**Corresponding author*

Keywords

Sugarcane peeling machine, Peeling, Sugarcane, Mechanisation, Peeling efficiency

Article Info

Accepted:
12 September 2020
Available Online:
10 October 2020

A B S T R A C T

Sugarcane is multipurpose crop that serves as source of sugar, juices, jaggery and various products for man and raw materials for industry. But prior to the process of machining process, some processing is required to remove the solid particles, spots and sludge on the cane. The processing of sugarcane strip for industrial or human use involves different operations of which peeling is a major one and cannot be neglected. Of all the unit operations involved in cane processing, several processes have been mechanized successfully. This study presents the features, prospects, performance evaluations and limitations of some sugarcane peeling machines in world like the fixed outer drum peeler, automated cane peeler, knife-edge type self-fed peeler, etc. Their peculiar advantages and operational parameters such as machine speed, output capacity, peeling efficiency and cane losses were evaluated. Aside from the manual ones, the ranges of the peeling efficiency and cane loss were recoded in range of 59.9 – 91.4 % and 2–4% respectively. As machine speed increased, the output capacity and cane loss increased while peeling efficiency decreased. Mechanization of this peeling process has the potential of encouraging growth in cultivation, cane utilization and improving the product quality of value-added products. The product quality, processing efficiency, minimum loss of cane and increased processing rate will be affected by improved sugarcane peeling process.

Introduction

The sugar cane family is made up of over 30 sugar cane varieties. Sugar cane is a perennial grass that thrives in hot, humid locations like Brazil and India. The sugar derived from sugar cane is used in syrups, juices, and molasses, but the rest of the plant can also be used in the production of environmentally friendly paper products.

The juice from the sugar cane's stalk is highly prized and is the source of 70% of the world's sugar. It also has the highest number of calories per unit area of any plant. Fresh sugarcane juice is a popular beverage in many countries particularly in Asian region such as China, India, Malaysia and Thailand due to its taste and cheap price. Flavonoids that can be found in sugarcane juice have the abilities to protect cells from degenerative processes and to reduce the development of health problems

ScienceDirect

Journal of Organometallic Chemistry
Volume 934, 15 February 2021, 121631

Design and synthesis of base-metal nickel(II) based catalysts: studies on nearly selective formation of 1-butene from ethylene ☆

Anshu Singh, Ankur Maji, Aurobinda Mohanty, Kaushik Ghosh

Show more

Outline | Share | Cite

https://doi.org/10.1016/j.jorganchem.2020.121631

Get rights and content

Highlights

- Design and synthesis of base-metal nickel(II) based catalysts.
- Molecular structures were determined by single crystal X-ray diffraction.
- Nearly selective formation of 1-butene from ethylene.
- Productivity up to 17.50 [kg (product/gm catalyst)] h^{-1} bar^{-1}.
- Probable reaction pathway.

Abstract

A new family of base-metal nickel complexes [Ni(L^{1-10})$_2$] (**1-10**) were synthesized from tridentate meridional ligands L^1H to L^{10}H (where H stands for dissociable proton). Different spectroscopic studies were utilized for the characterization of these complexes [Ni(L^{1-10})$_2$] (**1-10**). Molecular structures of complexes [Ni(L^1)$_2$] (**1**), [Ni(L^3)$_2$] (**3**) and [Ni(L^8)$_2$] (**8**) were determined by X-ray crystallography. Electronic properties of complexes [Ni(L^1)$_2$] (**1**) [Ni(L^3)$_2$] (**3**) and [Ni(L^8)$_2$] (**8**) were elucidated with the help of DFT and TD-DFT calculations. Complexes

Advertisement

Applied Organometallic Chemistry / Volume 35, Issue 5 / e6177

FULL PAPER

A new family of complexes derived from bis(imino)pyridine-type ligands: Crystal structures and bio-molecular interaction studies

Ovender Singh, Ankur Maji, Anshu Singh, Neetu Singh, Kaushik Ghosh ✉

First published: 15 February 2021
https://doi.org/10.1002/aoc.6177

Abstract

. Bis(imino)pyridine (NNN)-type ligand [(PyPhime-Cina) = 2,6-bis((E)-1-phenyl-2-((E)-3-phenylallylidene)hydrazinyl)pyridine] was synthesized, and a new family of metal complexes [Mn(PyPhime-Cina)Cl2] (**1**), [Fe(PyPhime-Cina)Cl2] (**2**), [Co(PyPhime-Cina)Cl2] (**3**), [Ni(PyPhime-Cina)Cl2] (**4**), and [Cu(PyPhime-Cina)Cl2] (**5**), derived from the ligand, have been synthesized and characterized. Molecular structures of the ligand and complexes **1-5** were determined using X-ray crystallography. Electronic properties and frontier molecular orbitals of the complexes were investigated by DFT and TD-DFT calculations. DNA interaction studies were evaluated by UV-visible absorption, fluorescence and circular dichroism spectral studies which indicated noncovalent binding of complexes with CT-DNA. Hirshfeld surface analysis of all the complexes was studied to know the weak interaction present in the molecules.

Open Research

DATA AVAILABILITY STATEMENT

Data are available upon request from the authors.

Supporting Information

Applied Organometallic Chemistry / Volume 35, Issue 5 / e6185
FULL PAPER

Mononuclear iron(III) complexes derived from tridentate ligands containing non-innocent phenolato donors: Self-activated nuclease, protease, and phenoxazinone synthase activity studies

Ankur Maji, Sweety Rathi, Anshu Singh, Udai P. Singh, Kaushik Ghosh

First published: 17 February 2021
https://doi.org/10.1002/aoc.6185

Funding information: CSIR, New Delhi, Grant/Award Number: 01(2942)/18/EMR-II

Abstract

The tridentate ligands ^{H}PhimpH, ^{OCH3}PhimpH, ^{CH3}PhimpH, ^{tBu}PhimpH, and ^{NO2}PhimpH have been synthesized and characterized. These tridentate ligands having non-innocent phenolato function, N_{py} and N_{im} donors upon deprotonation bind to iron(III) center resulting in a series of novel iron complexes, namely, [Fe(^{H}Phimp)$_2$](ClO$_4$) (**1**), [Fe(^{OCH3}Phimp)$_2$](ClO$_4$) (**2**), [Fe(^{CH3}Phimp)$_2$](ClO$_4$) (**3**), [Fe(^{tBu}Phimp)$_2$](ClO$_4$) (**4**), and [Fe(^{NO2}Phimp)$_2$](ClO$_4$) (**5**). Complexes were characterized by elemental analysis, IR, and UV–visible, and electrospray ionization mass spectral (ESI–MS) studies. Molecular structure of complex **2** was determined by single-crystal X-ray diffraction study. Electrochemical studies depicted Fe(III)/Fe(II) couple in the range of −0.50 to −0.65 V versus Ag/AgCl. Theoretical calculation using density functional theory (DFT) was also performed to optimize the geometrical and structural parameters. Time-dependent DFT (TD-DFT) was also optimized to observe the electronic properties, and data obtained were found to be consistent with experimentally observed values. Representative complex **4** exhibited nuclease and protease activities in the absence of external agents. Complex **4** was found to cleave the DNA and protein via self-activated mechanism. Complexes **1**–**5** were utilized to optimize oxidation of *o*-aminophenol in methanol. Complexes were found to be efficient in the oxidation of *o*-aminophenol. Kinetic experiments were also explored to gain better insight into the oxidation process.

CONFLICT OF INTEREST

There are no conflicts to declare.

Supporting Information

'end Orders for Reprints to reprints@benthamscience.net

Recent Advances in Computer Science and Communications, 2021, 14, 3025-3039

RESEARCH ARTICLE

Lifetime Maximization of Heterogeneous WSN Using Fuzzy-based Clustering

Ritu Saini[1], Kumkum Dubey[1], Prince Rajpoot[1,*], Sushma Gautam[1] and Ritika Yaduvanshi[2]

[1]Department of Information Technology. Rajkiya Engineering College. Ambedkar Nagar, Akbarpur, India; [2]Department of Computer Science and Engineering. Mahamaya College of Agricultural Engg and Tech. Ambedkar Nagar, Akbarpur, India

ARTICLE HISTORY

Received: March 03, 2020
Revised: May 14, 2020
Accepted: July 02, 2020

DOI:
10.2174/2666255813999200824123409

Abstract: ***Background***: Wireless Sensor Network (WSN) is an arising field for research and development. It has various applications ranging from environmental monitoring to battlefield surveillance and more. WSN is a collection of multiple sensor nodes used for sensing the environment. But these sensing nodes are deployed in such areas where it is not that easy to reach, therefore, the battery used in these nodes becomes quite impossible to change, hence there is a need to utilize this energy to get the maximum sensing for a long time.

Objective: To use the Fuzzy approach in the clustering algorithm. Clustering is a key approach to prolong the network lifetime with minimum energy utilization. In this paper, the focus is on the Cluster Head (CH) selection. So, we are proposing a clustering algorithm which is based on some of the attributes, including Average Residual Energy of CHs, Average Distance from nodes to CHs, Standard Deviation of member nodes, and Average Distance from CH to Base Station(BS).

Methods: Initially, some of the nodes are found to have greater residual energy than the average network energy, and fifteen populations are made, each having an optimum number of CHs. The final and best CHs set is chosen by determining the maximum fitness value using a fuzzy approach.

Result: The result positively supports the energy-efficient utilization with lifetime maximization, which is compared with the Base algorithm [1] and LEACH [2] protocol based on residual energy and the number of nodes that die after performing some rounds.

Conclusion: The proposed algorithm determines a fuzzy-based fitness value, provides load-balancing among all the networking nodes, and performs a selection of best Cluster Heads, resulting in prolonged network lifetime and maximized efficiency.

Keywords: Index Terms - Sensor Nodes, Wireless Sensor Network (WSN), Clustering, Network lifetime, Cluster Head (CH), Fitness Value, Fuzzy Logic, Base Station (BS).

1. INTRODUCTION

Wireless Sensor Network is a large collection of autonomously distributed, cost-effective, multiple sensors that have the capability to sense the surrounding fields [1-3] to perceive the data and to process it further to forward it to the Base Station(BS), as shown in Fig. (**1**). Nowadays, WSNs are applied to various fields like health-care, motion, activity, and target tracking [4], border and military [5] surveillance, industries, weather forecasting, etc. The major problems emerging in WSNs are the limited battery life of sensors and the inefficient use of energy and hence the limited network lifetime. Data communication between sensor nodes can be wired or wireless; sensors can have rechargeable or non-rechargeable batteries, but it becomes more efficient to use wireless communication and hence non-rechargeable batteries in case of remote areas; so here comes the need of better energy-efficient algorithm.

Initially, data was transferred directly to the base station, and then comes the multi-hop [6] transmission, which decreases energy utilization. To fix this problem of limited battery and energy constraint, Clustering [5], [7] becomes the best and efficient solution that divides the nodes into some clusters. Clustering is a technique in which the whole sensing area is divided into multiple clusters. Every cluster consists of a Cluster Head (CH) and some of the member nodes. CH in each cluster holds the responsibility to collect and aggregate the data from all the member nodes of its cluster and transmit it to the Base Station (BS) as represented in Fig. (**2**). Member nodes are the remaining nodes other than

*Address correspondence to this author at the Department of Information Technology. Rajkiya Engineering College. Ambedkar Nagar, Akbarpur, India; E-mail: princeraj@recabn.ac.in

2666-2566/21 $65.00+.00

© 2021 Bentham Science Publishers

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 9, Issue 10, October 2020

DOI 10.17148/IJARCCE.2020.91022

A study on Proxy Re-Encryption Schemes

Shashank Shekhar Tiwari[1], Hemant Kumar Baranwal[1], Shweta Tiwari[1], Ritika Yaduvanshi[2]

Department of Information Technology, Rajkiya Engineering College Ambedkar Nagar (U.P), India[1]

Department of Computer Science and Engineering, Mahamaya College of Agricultural Engineering and Technology, Akbarpur, Ambedkar Nagar (U.P), India[2]

Abstract: Proxy Re-Encryption (PRE) is now a primitive encryption used to assign decryption privileges. It was introduced by Blaze, Bleumer and Strauss. With the use of a proxy agent, PRE enables re-encryption of a ciphertext intended for one party to a ciphertext for another party. The underlying message and the sender's private key cannot be read by the proxy agent. The properties of proxy re-encryption systems with different classifications of proxy re-encryption schemes are discussed in this paper.

Keywords: Directionality, Distributed System, Encryption, Proxy re-encryption, Transitivity

I. INTRODUCTION

Encryption is a way to secure our data from unauthorized person. Proxy re-encryption helps in file security and distributed storage. The purpose of this technique is allowing re-encryption of one cipher text to another ciphertext. The encryption is done using private or public key for securing data and perform authentication via sharing security key. In situation where one user wants for another user to decrypt the message by using its own key or a new secret key instead of first user's secret key. An easily implemented re-encryption scheme is one of the proxy in which proxy given control of both User's key so the message will converted into plaintext and re-encrypted for another user or second user. User1's secret key used to decrypt the message from cipher-text into plaintext whereas User2's secret key used to encrypt it.

However, this is the rebelling against the primary goal of security; the goal of the proxy re-encryption is to prevent the disclosure of keys that involves in re-encryption and the plaintext that needs to be re-encrypted to the proxy. In this context, the above method mentioned is not ideal. So for a scenario where belief cannot be held in a proxy. The requirement here is to convert messages encrypted on behalf of User1's public key to messages encrypted on behalf of User2's public key without the proxy being free to decrypt the message. The scheme that ensure this action known as proxy Re-encryption. After all proxy re-encryption scheme is generally, a version of existing encryption scheme found to choose text, generation of keys, transmitting the keys between the concerns parties, conversion from plaintext to cipher-text on one side and conversion from ciphertext into plaintext on another side, the difference appears with the introduction or foundation of two more properties given bellow [1, 2,14]:

A. *Directionality*

Re-encryption scheme categorized as bi-directional and uni-directional scheme. If the re-encryption scheme is reversible then the same re-encryption key is used to convert the messages from User1 to User2 and vice-versa, this scheme is categorized as bi-directional scheme. In which if user sends the message to another, it automatically provides rights to communicate with the sender. In this case, the re-encryption keys are generated with the keys of both sender as well as receiver with their mutual trust and agreements.

A uni-directional scheme is defined as one way scheme in this scenario, giving a higher level of security and make it feasible in non-trusted setups where message transmission is important but not to an extent where receiver should be given authority to respond to it. So if a message is re-encrypted from User1 to User2 with a key and that is not possible the same message is used for re-encryption from User2 to User1. Uni-directional scheme are more useful and can be converted into bi-directional scheme at any time as easily by running in both directions [12].

B. *Transitivity*

Transitivity is defined as the number of re-encryptions allowed by an algorithm in proxy re-encryption scheme (PRE). A transitive PRE would allow a cipher text to be re-encrypted from User1 to User2 and again User2 to User3 and keeps on. While a non-transitive PRE do not allow to a cipher text to be re-encrypted more than one time but only once (or pre-defined limited times). This means in non-transitive scheme proxy does not have authority to appoint deputation rights to others besides the pair of communicating users. Besides the previous mentioned properties, some more of the security properties proved by existing proxy re-encryption scheme are the disability of proxy to see plaintext apart from the scheme. The secret key generated at the end of the owner, and proxy in no way can determine the secret key of sender and receiver from the re-encryption key.

This work is licensed under a Creative Commons Attribution 4.0 International License

ChemCatChem

10.1002/cctc.202000254

WILEY-VCH

FULL PAPER

Efficient Organoruthenium Catalysts for α-Alkylation of Ketones and Amide with Alcohols: Synthesis of Quinolines *via* Hydrogen Borrowing Strategy and their Mechanistic Studies

Ankur Maji,[a] Anshu Singh,[a] Neetu Singh[a] and Kaushik Ghosh*[a]

Dedicated to 60th birthday of Professor Goutam Kumar Lahiri, IIT Bombay, India

[a] Ankur Maji
Anshu Singh
Neetu Singh
Prof. Kaushik Ghosh
Department of Chemistry
Indian Institution of Technology Roorkee
Roorkee, Uttarakhand India 247667
E-mail: kaushik.ghosh@cy.iitr.ac.in, ghoshfcy@iitr.ernet.in
Homepage: https://www.iitr.ac.in/departments/CY/pages/People+Faculty+ghoshfcy.html
Supporting information for this article is given via a link at the end of the document. ((Please delete this text if not appropriate))

Abstract: A new family of phosphine free organometallic ruthenium(II) catalysts **(Ru1-Ru4)** supported by bidentate NN Schiff base ligands (L^1-L^4 where L^1= N,N-dimethyl-4-((2-phenyl-2-(pyridin-2-ylmethyl)hydrazineylidene)methyl) aniline, L^2= N,N-diethyl-4-((2-phenyl-2-(pyridin-2-ylmethyl)hydrazineylidene)methyl)aniline, L^3= N,N-dimethyl-4-((2-phenyl-2-(pyridin-2-yl)hydrazineylidene)methyl)-aniline and L^4= N,N-diethyl-4-((2-phenyl-2-(pyridin-2-yl)hydrazineylidene)methyl)aniline) were prepared and characterized. These half-sandwich complexes acted as catalysts for C-C bond formation and exhibited excellent performance in the dehydrogenative coupling of ketones and amides. In the synthesis of C–C bonds alcohols were utilized as the alkylating agent. A broad range of substrates, including sterically hindered ketones and alcohols, were well tolerated under the optimized conditions (TON up to 47000 and TOF up to 11750 h^{-1}). This ruthenium (II) catalysts were also active towards the dehydrogenative cyclization of o-amino benzyl alcohol for the formation of quinolines derivatives. Various polysubstituted quinolines were synthesized in moderate to excellent yields (TON up to 71000 and TOF up to 11830 h^{-1}). Control experiments were carried out and ruthenium hydride intermediate was characterized to support the reaction mechanism and probable reaction pathway of dehydrogenative coupling for the C-C bond formation has been proposed.

Introduction

The development of atom economical, eco-friendly and efficient methods for the synthesis α-alkylation of carbonyl compounds is a useful approach for the formation of carbon-carbon bonds.[1] Traditionally, alkylation process executed with alkyl halide as an alkylating source in the presence of a stoichiometric amount of base that leads to the desired product with the formation of toxic waste limiting its sustainable importance. Alkylation of carbonyl *via* borrowing hydrogen (BH) has emerged as an efficient and green choice for the formation of C–C bonds. The main advantage for such reactions would be the utilization of readily available and easy-to-handle ketones and amide as substrates and primary as well as secondary alcohols could act as an alkylating agent and water as by-product. Direct α-alkylation of ketones with primary alcohols has been functionalized under ruthenium,[2] iron,[3] iridium,[4] palladium,[5] copper,[6] manganese,[7] and cobalt[8] based catalysts or under transition metal-free conditions.[9] Similarly, various catalysts were also applicable for β-alkylation of secondary alcohols with primary alcohols.[10] Following the same strategy, alkylation of amides was also done *via* hydrogen transfer method with ruthenium,[11] manganese[12] and cobalt[13] based catalysts. However, alkylations of these substrates are found to be challenging with low catalyst loading. Amides have a comparably low CH-acidic nature due to resonance stabilization.

This type of acceptorless dehydrogenative C–C coupling can be applied for the synthesis of aromatic N-heterocyclic compounds such as quinolines, pyrimidines, pyrroles, and others. The annulation reactions of γ-amino- and 2-amino benzyl alcohols with ketones or alcohols currently require expensive iridium and ruthenium catalysts.[14]

α-alkylated carbonyl scaffolds were known to be biologically active due to their potential applications in anti-bacterial, anti-spasmodic, anti-inflammatory, analgesic, anti-diabetic, and anti-tumor activities[15] (Scheme 1). On the other hand, N-heterocycles have drawn wide attention, as their motifs are applied in functional materials, pharmaceuticals and dyes.[16]

Metal-ligand supportive catalysis can dramatically improve the catalytic performance of acceptorless dehydrogenative coupling reactions using pincer ligands bearing NH, OH or CH_2

Accepted Manuscript

Download full-text PDF | Read full-text | Download citation | Link copied

NJC

PAPER

View Article
View Journal | Vie

Cite this: New J. Chem., 2020, 44, 18399

Copper-based catalysts derived from salen-t ligands: synthesis of 5-substituted-1*H*-tetraz *via* [3+2] cycloaddition and propargylamines A^3-coupling reactions†‡

Anshu Singh, Ankur Maji, Aurobinda Mohanty and Kaushik Ghosh

Received 18th June 2020,
Accepted 26th August 2020

DOI: 10.1039/d0nj03081c

rsc.li/njc

Base-metal copper(II) complexes derived from unsymmetrical salen-type ligands were s synthesized using ligands L^1H to L^4H in moderate yield. The synthesized unsymmetrical li L^4H and the corresponding copper complexes (**1–4**) were characterized by UV-visible, IF spectroscopic studies. Molecular structures of complexes **1**, **2** and **4** were determin crystallography. Copper complexes **1–4** were employed as catalysts for [3+2] cycloaddition an reactions. The mutual approach of salen-type ligands and metals *via* active participation of lig achieve the catalytic reactions. Reaction pathways were proposed and possible intermediate s the catalytic cycle were successfully characterized by ESI-MS spectroscopic studies.

Published on 27 August 2020. Downloaded by Indian Institute of Technology Roorkee on 11/8/2020 5:41:38 PM.

Introduction

Transition metal complexes supported by Schiff base ligands have been extensively studied because of their prospective use as catalysts in a wide range of C–C and C–N bond formation reactions such as cyclopropanation, aziridination, [3+2] cycloaddition reactions, A^3-coupling, *etc.*[1] The [3+2] cycloaddition reaction is a reaction where two organic compounds, a dipolarophile and an ylide (1,3 dipole), combine to form a five membered heterocycle.[2] For example, tetrazoles could be synthesized by [3+2] cycloaddition of nitriles and azides.[3] Tetrazoles are a very important class of heterocyclic compounds which are also found in natural products. These compounds exhibit interesting biological activities and in several cases are exploited in medicinal chemistry.[4–9] Tetrazoles have been used as antibacterial, antiviral, antifungal, and antihypertensive drugs. Moreover, thiotetrazolyl acetanilide derivatives are utilized as inhibitors for HIV-1 reverse transcriptase. Tetrazoles are also utilized as ligands in coordination chemistry for the synthesis of coordination complexes having important biological functions (shown in Scheme 1).[10–14]

A^3-coupling reaction is a multicomponent reaction where three or more starting materials react to form a single product.[15–17] A^3-Coupling reaction of amines, alkynes and al attracted much attention because of its appropriate ap friendly and atom economy reaction conditions.[18] I propargylamines, which could be synthesized by reaction, were utilized as the precursor for the various nitrogen containing heterocyclic compound heterocyclic compounds are extremely significant for of biologically active molecules.[23–28] Further, deriv pargylamines have found direct application in the neurodegenerative diseases such as Alzheimer's and disease.[29,30] Some of the therapeutic molecules, *e.g.* TV-3326,[32] rasagiline[33] and PF960IN,[34] are syn A^3-coupling reaction and are depicted in Scheme 2

In the recent literature, the research tendency metal catalysts, earth abundant catalysts, low cost met and their catalytic activity.[35–39] We have been working complexes and have reported a few catalytic activities In fact a few important recent publications drew our a Sardian and co-workers utilized copper complexes s ligands having N_2O_2 donors for tetrazole synthesis.[42] co-workers reported copper based catalysts for A^3-coupl and co-workers utilized salen-type NO_2 donors Cu(II) complexes as catalysts for tetrazole synthesi A^3 coupling.[44]

A closer look at the copper-based catalysts desc clearly depicts that the copper complexes were d salen-type of ligands. Interestingly, the design and these copper-based complexes are very simple, easy This prompted us to design and synthesize new c complexes for the study of [3+2] cycloaddition

Department of Chemistry, Indian Institute of Technology Roorkee, Roorkee 247667, Uttarakhand, India. E-mail: kaushik.ghosh@cy.iitr.ac.in; Fax: +91-1332-273560; Tel: +91-1332-275547

† Dedicated to Professor Samaresh Bhattacharya.

‡ Electronic supplementary information (ESI) available: NMR, ESI-MS, and UV-visible spectral data and information on X-ray crystal structure. CCDC 2003306 (1), 2003307 (2) and 2003305 (4). For ESI and crystallographic data in CIF or other electronic format see DOI: 10.1039/d0nj03081c

This journal is © The Royal Society of Chemistry and the Centre National de la Recherche Scientific

after 4 h.

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 9, Issue 10, October 2020

DOI 10.17148/IJARCCE.2020.91022

A study on Proxy Re-Encryption Schemes

Shashank Shekhar Tiwari[1], Hemant Kumar Baranwal[1], Shweta Tiwari[1], Ritika Yaduvanshi[2]

Department of Information Technology, Rajkiya Engineering College Ambedkar Nagar (U.P), India[1]

Department of Computer Science and Engineering, Mahamaya College of Agricultural Engineering and Technology, Akbarpur, Ambedkar Nagar (U.P), India[2]

Abstract: Proxy Re-Encryption (PRE) is now a primitive encryption used to assign decryption privileges. It was introduced by Blaze, Bleumer and Strauss. With the use of a proxy agent, PRE enables re-encryption of a ciphertext intended for one party to a ciphertext for another party. The underlying message and the sender's private key cannot be read by the proxy agent. The properties of proxy re-encryption systems with different classifications of proxy re-encryption schemes are discussed in this paper.

Keywords: Directionality, Distributed System, Encryption, Proxy re-encryption, Transitivity

I. INTRODUCTION

Encryption is a way to secure our data from unauthorized person. Proxy re-encryption helps in file security and distributed storage. The purpose of this technique is allowing re-encryption of one cipher text to another ciphertext. The encryption is done using private or public key for securing data and perform authentication via sharing security key. In situation where one user wants for another user to decrypt the message by using its own key or a new secret key instead of first user's secret key. An easily implemented re-encryption scheme is one of the proxy in which proxy given control of both User's key so the message will converted into plaintext and re-encrypted for another user or second user. User1's secret key used to decrypt the message from cipher-text into plaintext whereas User2's secret key used to encrypt it.

However, this is the rebelling against the primary goal of security; the goal of the proxy re-encryption is to prevent the disclosure of keys that involves in re-encryption and the plaintext that needs to be re-encrypted to the proxy. In this context, the above method mentioned is not ideal. So for a scenario where belief cannot be held in a proxy. The requirement here is to convert messages encrypted on behalf of User1's public key to messages encrypted on behalf of User2's public key without the proxy being free to decrypt the message. The scheme that ensure this action known as proxy Re-encryption. After all proxy re-encryption scheme is generally, a version of existing encryption scheme found to choose text, generation of keys, transmitting the keys between the concerns parties, conversion from plaintext to cipher-text on one side and conversion from ciphertext into plaintext on another side, the difference appears with the introduction or foundation of two more properties given bellow [1, 2,14]:

A. *Directionality*

Re-encryption scheme categorized as bi-directional and uni-directional scheme. If the re-encryption scheme is reversible then the same re-encryption key is used to convert the messages from User1 to User2 and vice-versa, this scheme is categorized as bi-directional scheme. In which if user sends the message to another, it automatically provides rights to communicate with the sender. In this case, the re-encryption keys are generated with the keys of both sender as well as receiver with their mutual trust and agreements.

A uni-directional scheme is defined as one way scheme in this scenario, giving a higher level of security and make it feasible in non-trusted setups where message transmission is important but not to an extent where receiver should be given authority to respond to it. So if a message is re-encrypted from User1 to User2 with a key and that is not possible the same message is used for re-encryption from User2 to User1. Uni-directional scheme are more useful and can be converted into bi-directional scheme at any time as easily by running in both directions [12].

B. *Transitivity*

Transitivity is defined as the number of re-encryptions allowed by an algorithm in proxy re-encryption scheme (PRE). A transitive PRE would allow a cipher text to be re-encrypted from User1 to User2 and again User2 to User3 and keeps on. While a non-transitive PRE do not allow to a cipher text to be re-encrypted more than one time but only once (or pre-defined limited times). This means in non-transitive scheme proxy does not have authority to appoint deputation rights to others besides the pair of communicating users. Besides the previous mentioned properties, some more of the security properties proved by existing proxy re-encryption scheme are the disability of proxy to see plaintext apart from the scheme. The secret key generated at the end of the owner, and proxy in no way can determine the secret key of sender and receiver from the re-encryption key.

Copyright to IJARCCE

This work is licensed under a Creative Commons Attribution 4.0 International License

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 7, Issue 8, August 2020

DOI 10.17148/IARJSET.2020.7821

Modelling of Barriers to Innovation for SMEs of Developing Countries Using ISM Approach

Er. Vijay Kumar Yadav[1], Er. Ashish Gupta[2]

Corresponding Author, Mahamaya College of Agricultural Engineering & Technology, Akbarpur, Ambedkarnagar, UP[1]

Mahamaya College of Agriculturual Engineering and Technology, Akbarpur Ambedkarnagar UP[2]

Abstract: For the growth of the country it is important to identify the factor which is responsible. In our study on innovation we found out eight barriers of innovation for SMEs which are modelled using ISM approach. In our result customer response and corruption was top rated barrier. While Taxation was bottom rated barrier further these factors were classified on their driving power and dependency power.

Keywords: Innovation, barriers, ISM, Modeling, SMEs etc.

I. INTRODUCTION

Small and Medium Enterprises (SMEs) are regarded as the main source of entrepreneurship and innovation. These enterprises provide employment to large number of people and contribute significantly to growth and GDP of an economy. In the world economy, knowledge as a determinant of competitive advantage is gradually replacing traditional factors of production like labour and capital. In order to survive and compete in the globalized market, small and medium enterprises need to use knowledge to innovate. In India, small and medium enterprises contribute about 45 percent of the gross turnover in the manufacturing sector and 40 percent of total exports **(Nomita Sharma, 2017).** According to **(O'Bran, 2013)** in America innovation is a very important in our field to achieve their mission vision, and objectives statement. The politician and chief innovation officer are regularly mention the term innovation, **(Kurtao, 2014)** have find out important barrier of innovation which are given as Product Innovation, Process Innovation, Marketing Innovation, Business model Innovation, Supply chain Innovation and Organizational Innovation.

Indian industry has a history of scarce, and hence too expensive, capital; as a result, banks and other sources of capital continue to be conservative. Organisational barriers start from the top and include lack of goals and disinclination to risk, which is particularly high in knowledge creation and innovation activities; a preference for emerging improvements over revolutionary transformation; and failure to evolve unique, competitive business models **(Krishnan, 2006).**

Managerial positions in India are for away from technical work. This creates barriers to innovation including: stiffness with technology and a perception of loss of control among managers and owners; failure to create durable R&D departments and board-level representation for the R&D function; insufficient investment in plant and machinery, old fashioned production tools and inadequate use of computers on the shop floor; the lack of a process positioning; belittle of commercialisation costs, poor quality product development skills, long development cycles and shifting priorities. Companies also fail to invest in training and development of skills in-house, team building, implant innovation systems, insufficient knowledge management systems and creative performance management systems. Public research firms and academic institutions also lack goal orientation and a strong research culture.

Nakane and Hall 2007 presented that some of the producers were undergoing a paradigm shift in the way they look at manufacturing operations there days. As of today, Indian firms have not fared well against the belligerent competitive master plan adopted by their international participants. **AHaleem et al 2012** has been identified distinguish some critical CSFs that are reason for growth of manufacturing sector. The attraction of enablers of innovation of SMEs are study and modelling approximate is used to customize the position of enablers. ISM is applied to comprehend the contextual relationship among the enablers and find out the critical elements of SMEs. **Gorodnichenko, Svejnar and Terrall 2015** have find that opening of border to trade and foreign investment, globalization brings golden time and pressures for domestic firms in upcoming market economy to innovate and improve their competitive positions. Many of these pressures and outcomes operate through increased competitions from and linkage with foreign companies.

This paper is presented in the following order. Section two presents the literature review and previous related work, along with the establishment of barrier. Third section shows the ISM model. Fourth section explains the results obtained. And finally, on fifth section the main conclusions and discussions are provided.

This work is licensed under a Creative Commons Attribution 4.0 International License

International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979; Impact Factor: RJIF 5.72
Received: 01-11-2019; Accepted: 02-12-2019
www.allsubjectjournal.com
Volume 7; Issue 1; January 2020; Page No. 01-04

Experimental Investigation for photo-voltaic power generation using the concept of solar tree

AD Gupta[1*], Avinash Mishra[2], RK Mehta[3], Yashi Gupta[4], SK Pandey[5]
Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, India

Abstract
Solar energy is abundant in quantity and free of cost. Solar PV technology converts incoming radiation from Sun directly into electricity, which makes it one of the most promising renewable technologies available for sustainable development. However, it consumes a large amount of land, which can be used for other human activities. Solar PV tree is a novel technique used for Sunlight capture. It consists of PV panels fixed as leaves on a tree-like structure, and it reduces the land footprint of the PV system.

In this study, the daily energy output of a 36 Watt solar system is maximized. For that, the flexible tree structure is designed. Energy output is maximized by varying the branch angle of the tree structure. Also, comparison of energy output for the standard layout and solar tree of 18 watt is done. The study showed that Solar Tree is a good alternative for the solar power generation instead of conventional layout of photovoltaic generation. Using Solar Tree we can reduce the land footprint area of solar power generation which can save land for other applications. The daily energy output from the Solar Tree can be increased as compared to the standard PV layout. Configuration I, defined in the study is found as optimum at which the energy output increased up to 59.11%.

Keywords: solar, abundant, experimental, generation, investigation

1. Introduction

The proliferating energy demand of the 21st-century modern society is putting immense pressure on the depleting fossil fuel based energy sources of the world. Renewable energy sources are vital to meet the energy demand of the future. Renewable energy based sustainable development have become the main agenda for a clean and green future of the earth. Among all the renewable energy based technologies available commercially, solar PV technology is considered to be mature, stable, and easy to implement and maintain, it is capable of meeting the energy demands with minimal impact on the environment. It involves a photoelectric conversion of incoming photons from the Sun into electricity via a PN junction, usually made with silicon wafers. The PV cell manufacturing process is being heavily researched upon to improve the cell conversion efficiency, reduce the cost of manufacturing and to decrease the energy utilization in the process. Favourable government policies, the uncertainty of grid supply and environmental concerns have contributed towards the rapid development of PV based energy systems around the world in recent years. Solar photovoltaic technology has been noted to be highly beneficial in off-grid rural areas, island nations, and household applications. However despite all the merits, one of the major drawbacks of solar PV is its area requirement; with land being an indispensable necessity for agriculture, transport, industry, and housing, the area requirement of PV systems is to be reduced to enhance its implementation. Rooftop solar PV systems reduce the burden of land required for solar PV systems by installing PV panels on the rooftops of the buildings and houses as well as their facades and walls [1]. Discussed a detailed design and cost analysis for a stand-alone rooftop PV system in India and [2] evaluated the economic viability of rooftop solar for the climate of Iran [3]. Suggested the use of floating solar power plants in their article to reduce the land burden of solar PV systems. Apart from floating solar power plants, recent years have seen an increase in the implementation of building integrated solar PV systems (BIPV) to reduce the land requirement of PV systems. The use of three-dimensional PV structures can also enhance the energy production while consuming less land. The land-based PV systems are usually fixed at a particular set of angles to optimize production during peak Sunshine hours. However, this two-dimensional design of the PV array hampers their effectiveness in Sunlight capture throughout the day and around the year [4]. Pointed out that trees are more effective than PV panels in capturing Sunlight due to the random orientation of its leaves (as some leaves would always encounter normal angles of incidence, although others would encounter grazing angles of incidence) and its three-dimensional structure. One of the routes to solve this issue is the novel concept of a solar PV tree; which is an artistic imitation of natural trees with photo-voltaic panels replacing the leaves and a metal frame taking the place of the branches and trunk. It can generate more power per unit area and capture Sunlight throughout the day owing to its panels being oriented at different angles as discussed by [4] in their simulation study. Various working models of solar PV tree have been demonstrated around the world, some of which are compiled in this thesis further.A solar tree can also be a decorative means of producing renewable electricity. "TREE stands for T = Tree generating R = Renewable E = Energy and E = Electricity". The objectives of a solar tree concept are:-

- To enhance the efficiency of solar PV systems using a three-dimensional structure replicating a natural tree.
- To reduce the land required to harness solar energy.

Dalton Transactions

PAPER

View Article Online
View Journal | View Issue

Check for updates

Cite this: *Dalton Trans.*, 2019, 48, 17083

Ferrocenyl palladacycles derived from unsymmetrical pincer-type ligands: evidence of Pd(0) nanoparticle generation during the Suzuki–Miyaura reaction and applications in the direct arylation of thiazoles and isoxazoles†

Ankur Maji,[a] Anshu Singh,[a] Aurobinda Mohanty,[a] Pradip K. Maji *[b] and Kaushik Ghosh *[a]

Received 26th August 2019,
Accepted 16th October 2019

DOI: 10.1039/c9dt03465j

rsc.li/dalton

A new family of ferrocenyl-palladacycle complexes Pd(L^1)Cl (**Pd1**) and Pd(L^2)Cl (**Pd2**) were synthesized and characterized by UV-visible, IR, ESI-MS, and NMR spectral studies. The molecular structures of **Pd1** and **Pd2** were determined by X-ray crystallographic studies. Palladacycle catalyzed Suzuki–Miyaura cross-coupling reactions were investigated utilizing the derivatives of phenylboronic acids and substituted chlorobenzenes. Mechanistic investigation authenticated the generation of Pd(0) nanoparticles during the catalytic cycle and the nanoparticles were characterized by XPS, SEM and TEM analysis. Direct C–H arylation of thiazole and isoxazole derivatives employing these ferrocenyl-palladacycle complexes was examined. The reaction model for the arylation reaction implicating the *in situ* generation of Pd(0) nanoparticles was proposed.

Introduction

Over the past few decades, ferrocene has been the most employed metallocene due to its unique electrochemical properties and its applications in medicinal chemistry.[1] On the other hand, ferrocene-based co-ordination complexes have been utilized for molecular recognition and as cytotoxic agents.[2] Cyclometalated organometallic complexes based on 6-phenyl-2,2′-bipyridine (NNC) have been widely utilized for their catalytic and luminescence properties.[3] Reports on ferrocenyl based NNC ligands and their metal complexes are scarce in the literature; however, ferrocene based ligands having a combination of phosphorus, nitrogen and sulfur are known.[4] The presence of a Pd–C σ-bond as the central or exterior donor site plays a significant role in thermal stability, potential hemilability and catalytic activity.[5] Along the same lines, the use of the palladacycles of ligands having (N,N) donor groups present in an arm of ferrocene is limited and, to the best of our knowledge, their catalytic applications have not been reported in the literature.[6]

In fact, this class of ligands were utilized for the chelation assisted C–H bond functionalization of the C2 position of ferrocene derivatives.[7] Several transition metals like Ir, Rh, and Pd have been used for the activation of the C2–H of the ferrocene moiety and for the synthesis of ferrocene derivatives.[8]

The Suzuki–Miyaura cross-coupling (SMC) reaction is the traditional method for C–C bond formation. Palladium complexes derived from phosphine-based ligands are the conventional ligands for the SMC coupling reaction.[9] At present organometallic pincer type (NNC or NCN) palladium(II) complexes with different types of donor atoms are widely employed as catalysts for coupling reactions.[10] The use of ferrocene based organometallic complexes in such cross-coupling reactions is less explored yet.[11] Though the SMC reactions of aryl bromides and iodides are available, reports on aryl chlorides are not abundant due to the difficulty in the activation of C–Cl bonds compared to C–Br or C–I bonds with low catalyst loading (0.0001 mol%).[12]

Compared to well-recognized traditional cross-coupling reactions, the palladium-catalyzed direct arylation *via* C–H

[a]*Department of Chemistry, Indian Institute of Technology Roorkee, Roorkee 247667, Uttarakhand, India. E-mail: ghoshfcy@iitr.ernet.in; Fax: +91-1332-273560; Tel: +91-1332-275547*

[b]*Department of Polymer and Process Engineering, Indian Institute of Technology Roorkee, Saharanpur Campus, Saharanpur, UP 247001, India. E-mail: pradip.fpt@iitr.ac.in*

†Electronic supplementary information (ESI) available: Experimental section, NMR, MS, and UV-visible spectral data and information on DFT calculations. X-ray crystal structure data have been deposited in the Cambridge Crystallographic Data Centre and the deposition number for complex **Pd1** is CCDC 1939017 and for complex **Pd2** is CCDC 1939018. For ESI and crystallographic data in CIF or other electronic format see DOI: 10.1039/C9DT03465J

This journal is © The Royal Society of Chemistry 2019

Received: 3 October 2018 | Revised: 19 November 2018 | Accepted: 4 December 2018
DOI: 10.1002/aoc.4825

Check for updates

FULL PAPER

WILEY Applied Organometallic Chemistry

Selective oxidation of benzyl alcohol to benzaldehyde, 1-phenylethanol to acetophenone and fluorene to fluorenol catalysed by iron (II) complexes supported by pincer-type ligands: Studies on rapid degradation of organic dyes

Ovender Singh | Priyanka Gupta | Anshu Singh | Ankur Maji | Udai P. Singh | Kaushik Ghosh

Department of Chemistry, IIT Roorkee, Roorkee 247667, Uttarakhand, India

Correspondence
Kaushik Ghosh, Department of Chemistry, IIT Roorkee, Roorkee - 247667, Uttarakhand, India.
Email: ghoshfcy@iitr.ernet.in

Funding information
Department of Science and Technology (DST) New Delhi, and Science and Engineering Research Board (DST-SERB), Grant/Award Number: SR/S1/IC-47/2012; MHRD

Hexacoordinated non-heme iron complexes $[Fe^{II}(L^1)_2](ClO_4)_2$ (1) and $[Fe^{II}(L^2)_2](PF_6)_2$ (2) have been synthesized using ligands L^1 = (E)-2-chloro-6-(2-(pyridin-2ylmethylene) hydrazinyl)pyridine and L^2 = (E)-2-chloro-6-(2-(1-(pyridin-2-yl)ethylidene)hydrazinyl) pyridine]. These complexes are highly active non-heme iron catalysts to catalyze the C (sp^3)–H bonds of alkanes. These iron complexes have been characterized using ESI–MS analysis and molecular structures were determined by X-ray crystallography. ESI – MS analysis also helped to understand the generation of intermediate species like Fe^{III}–OOH and Fe^{IV}=O. DFT and TD–DFT calculations revealed that the oxidation reactions were performed through high-valent iron center and a probable reaction mechanism was proposed. These complexes were also utilized for the degradation of orange II and methylene blue dyes.

KEYWORDS
C-H bond activation, iron oxo (Fe^{IV}=O) intermediate, organic dyes degradation eration gen, reactive HO• radical

1 | INTRODUCTION

The oxygenation of non-activated alkyl C-H bonds is a challenging area of research owing to their chemical inertness towards chemical oxidation. Consequently, highly reactive species, generated by a suitable catalyst, are necessary to perform such chemistry.[1] In the chemical industries, such catalytic oxidation and during the oxidation process, desired selectivity of the organic molecules produced, was extremely important.[2] It is well known that alkanes are thermodynamically stable and difficult to oxidize in a controlled and selective fashion. Chromate and permanganate have already been used as conventional oxidants however these oxidants are rather inefficient and barely selective,[3] thus enhancement in the efficiency and selectivity of the hydrocarbon oxidation became the goal of industrial as well as academic research. Nature has developed several metalloenzymes (heme as well as non-heme) which selectively catalyze the oxidation of hydrocarbon.[4–7] Iron containing metalloenzymes play an important role in these biological processes. For example, cytochrome P450 selectively oxidizes the aliphatic side chain of cholesterol, and the same metalloprotein is involved in biosynthesis of the female hormone progesterone.[8] Iron-dependent cytosolic protein, soluble methane monooxygenase (sMMO) activates C-H bond and converts methane to methanol[9] Fe^{III}-OOH species has been observed and was implicated in the catalytic cycle of C-H bond oxidation. Anticancer drug bleomycin, naphthalene dioxygenase, and Rieske

© 2019 John Wiley & Sons, Ltd.

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Vol. 8, Issue 7, July 2019

VANET: Attacks and Privacy Preserving Protocols

Ritika Yaduvanshi[1], Shashank Shekhar Tiwari[2], Kumkum Dubey[2], Prince Rajpoot[2], Shivendu Mishra[2]

Department of Computer Science and Engineering, Mahamaya College of Agricultural Engineering and Technology, Akbarpur, Ambedkar Nagar (U.P), India[1]

Department of Information Technology, Rajkiya Engineering College Ambedkar Nagar (U.P), India[2]

Abstract: Now days, it is seen that VANET are widely spread in the world of vehicular transportation. It is different from the other networks because of its features and working. Main function of Vehicular Ad-hoc Network is to provide safety, increases driving experiences, and good management of the traffic. Further, VANET focuses on private data transferring from one vehicle to other with threat less data management. In this paper, we will discuss about the various features of VANET's with possible attacks, and security requirements in VANET. Moreover, some of the privacy preserving protocols are also describe with their advantages and disadvantages.

Keywords: Vehicular Ad-hoc Network (VANET), Trusted Authorities (TA), Security, Privacy, Message Authentication Code (MAC).

I. INTRODUCTION

Vehicular ad-hoc network is the combination of dynamic and mobile nodes for unstable networks without any help of fixed infrastucture. Mobile ad-hoc networks' principles are the basis for vehicular ad-hoc network. It is based on wireless network technology for exchanging data from vehicle to vehicle within the domain of vehicles.VANET have three most important elementsie. Roadside Units (RSUs), Trusted Authority (TA), and a vehicle with embedded On-Board Units (OBUs). Trusted authority (TA) is responsible for maintenance and storage capabilty of the whole system TA is used to register each RSUs at the road side and OBUs attached with vehicle.RSUs are storage database they have storing information coming from TA and OBUs. RSUs works between TA and OBUs, RSUs also helps to track the harmful vehicle[2].OBUs are used to collect, share traffic information, andto communicate with other vehicles, and increases careful driving environment.There are three kinds of communication exists in VANETs i.e. Vehicle to Vehicle Communication (V2V), Vehicle to Infrastructure Communication (V2I), and Infrastructure to Vehicle communication (I2V)[1].

A. *Features of VANET*

VANET has defferent features which are following-:

- **High Mobilty:** In VANETs nodes which are basically the vehicles generally move at high speed. Thus it is difficult to find the position of nodes hence making security and privacy of node.
- **Dynamic Topology:** Because of the dynamic infrastucture of nodes,It is very difficult to calculate all the nodes position. Thus networks topology in Vehicular ad-hoc netwoks changes on a frequent interval. Further More, The link connections between the vehicles in VANETs has regularly not stable connection due to dynamically nodes position in the environment.
- **Wireless Communication:**Nodescommunication are wireless in VANETs hence security measures must have been taken while communication.
- **Unbounded network size:**In VANETs the size of Network is geographically unbounded. Therefore, VANETs can be implemented at any place i.e. for any city, country and other geaographical areas.
- **Time Critical:**The sending and the receiving of the information to the nodes in VANETs must have been within time interval. So all nodes in VANETs are updating regularly and exchange informaton very fast to each other, critical medical emergency messages must have been delivered on time so save human lives.
- **No Power limitation:**As in MANET there is concerned energy and computation resaurces, the VANET doesn't have the same. That can be further utilized in efficient processing of complex and computational hungry routing and security mechanism.

Copyright to IJARCCE

DOI 10.17148/IJARCCE.2019.8705

ORIGINAL ARTICLE e-ISSN: 2349-0659 p

Effect of Social Distancing on Coronavirus Disease Spread Controlling: A Mathematical Modeling

Ritika Yaduvanshi[1], Nimisha Yadav[2], Prince Rajpoot[3], Shivendu Mishra[3]

Abstract

Coronavirus disease 2019 (COVID19), the outbreak of the novel coronavirus, has posed an unprecedented public h many other countries in the world at present, with a significant effect on health and public health systems, individ world economic. COVID-19 has been declared by the WHO as a pandemic. The structures of public contact signific this infection and, in the absence of vaccines, the control of these structures through extensive social distancing to be the most effective means of mitigation. In this paper, to examine the impact of social distancing in COVID 19 mathematical model using direct correlation between social exposure and reproduction number. We show that distance is an efficient way of monitoring the spread of COVID-19 in the absence of vaccines. In India, we have also reproduction number is 2.5.

Keywords: Coronavirus, Coronavirus disease 2019, Mathematical model, Pandemic, Reproduction number, Social d

Asian Pac. J. Health Sci., (2021); DOI: 10.21276/apjhs.2021.8.1.10

Introduction

A large family of viruses known as coronaviruses may cause in humans, several coronaviruses ranging from the common cold to more brutal diseases such as Middle East respiratory syndrome and severe acute respiratory syndrome are known the basis of respiratory infections. The most newly revealed coronavirus causes coronavirus disease (COVID-19). COVID-19 was first reported in month of the December 2019, in the Wuhan city of China. COVID-19 has further spread from Wuhan city to other cities of China and various other countries in the world. COVID19 has wide and rapid spread in the community of most of the countries due to which WHO declared COVID-19 disease as a public health emergency of international concern in January 30, 2020. The global confirmed cases by April 28, 2020, have reached 3,132,312, with a death case of 221,436 and recovered cases of 953,309. COVID-19 epidemic is great harm to people's daily life and country's economic development. COVID-19 has experienced four stages since its reporting: Initial stage, local eruption, community spread, and widespread transmission. China witnessed the fourth stage of transmission earlier in February 2020 while countries such as Italy and the USA are in fact currently in the fourth stage.[1-3]

As per Indian Council of Medical Research, world second population country India is currently in Stage-2 of transmission. This is because of Indian government's sudden and strict enforcement of 21 days national lockdown from March 25, 2020, with further extended until May 3, 2020. In India, the initial case of COVID-19 was reported on January 30, 2020, originating from China. Further, India has reported 31,324 confirmed cases with a death case of 1008, and 7, 747 recovered cases as on April 28, 2020.[2,4] COVID-19 symptoms are very similar to flu such as cough, cold, fever, tiredness, nasal congestion, runny nose, sore throat, diarrhea, and breathing problem. COVID-19 infection increasing rapidly and until now there is no vaccine is announced or available.

[1]Department of Computer Science and College of Agricultural Engineering ar Uttar Pradesh, India

[2]Department of Mathematics, Veer Ba University, Jaunpur, Uttar Pradesh, India

[3]Department of Information Technology, R Ambedkar Nagar, Akbarpur, Uttar Pradesh,

Corresponding Author: Shivendu Mishra, I Technology, Rajkiya Engineering College, A Uttar Pradesh, India. E-mail: shivendu0584

How to cite this article: Yaduvanshi R, Ya Effect of Social Distancing on Coronavi Controlling: A Mathematical Modeling. 2021;8(1):48-52.

Received: 29/10/2020 **Revised:** 26/11/202(

Source of support: Nil

Conflicts of interest: None

Received: 29/10/2020 **Revised:** 26/11/202(

infection like COVID-19 pandemic is n number R0. Reproduction number repre: of people infected by a sick person du pandemic and incubation period is t person feels the symptoms. The incubat on average 5–6 days and may be up to 14 actions on the outbreak COVID-19, it is i or the modeler to predict the role of s number of confirmed infected cases, or on reproduction number, and duration c

Keeping the above in mind, throug proposes a mathematical model using d social exposure and reproduction numb social distancing in the spread controlli

TO STUDY THE HALL EFFECT ON MHD FLOW IN A ROTATING SYSTEM

NIMISHA YADAV, P C YADAV ,RITIKA YADUVANSHI

Abstract: In this paper, we have proposed to study the free convection flow caused by buoyancy force when the semi-infinite span of fluid bounded by an infinite vertical porous plate rotates in unison about an axis perpendicular to the plate. The effect of Hall and rotation parameters on the drag experienced by the fluid particles at the plate has been discussed for constant and variable suction cases. The effect of small and large frequencies on flow parameter is discussed with the help of tables. An attempt is made to analyse the unsteady free convection MHD flow in a rotating frame of reference

Key Words: MHD oscillatory flow, Navier-Stokes equations , Hall parameter, Prandtl number, Grashof number, frequency parameter etc.

1 .Introduction:

The flow in the rotating frame of reference has attracted the attention of a number of scholars in geophysical engineering. There appeared a number of studies in literature viz. Vidyanidhy and Nigam [1], Gupta [2] and Jana and Datta [3]. The effect of uniform transverse magnetic field with or without suction was investigated by Gupta [8], Soundalgekar and Pop [1,2,3,4] and Mazumdar et al. [5]. The similarity solutions of the unsteady Navier-Stokes equations in a rotating frame of reference has been obtained by Gupta [6] Chandran et al. [7] and Singh et al. [8] studied the unsteady, MHD Couette flow of electrically conducting fluid in a rotating system. Bergstorm et al. [9,10] studied the flow in a rotating system.

The flow problem in a rotating system has been studied by several authors. It is well known that in a rotating fluid near the flat plate. Ekman layer exists, where the viscous and coriolis forces are of the same order of magnitude. Raptis et al. [11] have discussed the effects of mass transfer and free convection current on the flow past an infinite vertical porous plate with constant heat flux in a rotating fluid. An analysis of Hall and ion-slip current affects on the unsteady MHD free convection flow of a partially ionized fluid past an infinite vertical porous plate in a rotating system subject to a strong transverse magnetic field and fluctuating plate temperature with time about a constant non-zero mean is carried out by Ram [1,3]. Sacheti et al. [12,5] studied the effect of free convection in a vertical channel of rotating porous medium. Sharma et al. [16,17] studied the effect of unsteady flow and heat transfer through a porous medium in the presence of heat source and variable free streams.

Barcilon and Pedlosky [18] studied the linear theory of temperature dependent rotating stratified fluid motion. Recently the study of flow under strong magnetic field when the whole system is rotating with angular velocity about a fixed point in the frame of reference has provided a new impetus specially to practical engineers who are interested in MHD power generator and cooling turbine blades. Ingham
[4,5] have studied hydro magnetic flow in a rotating frame of reference. Forced and natural flows were discussed by Schlitching [1,6], Eckert and Drake [6] and Bansal [1].

1.1 Basic equations:

Consider an unsteady incompressible flow of electrically conducting fluid past an infinite vertical flat plate placed in x^*, z^* plane, y^* axis is taken normal to the plate. A uniform magnetic field of strength B_0^* is acting along y^* axis. The entire system of the fluid and the plate is in a state of uniform rotation about y^* axis. Since the length of the plate is large, therefore, all the physical variables depend on y^* only. The interaction of coriolis force with the hydro magnetic free convection sets up a secondary flow in addition to primary flow and hence the flow becomes to be three-dimensional. Since the plate is of infinite extent along x^* and z^* directions, all the physical variables (except pressure) are the functions of y^* and t^*

To Study The Effect Of Convection And Electric Field Load Parameter On Mhd Couette Flow Past A Channel With Highly Permeable Bed.

[1]Nimisha Yadav, [2]P .C. Yadav, [3]Ritika Yaduvanshi , [4]Shivendu Mishra
[1]Assistant Professor r, [2]Assistant Professor , [3]Assistant Professor
[1]Department of Mathematics,
U N S I E T V B S Purvanchal University Jaunpur U P- 222001

[2]Department of Electronics and Communication Engg.
U.N.S.I.E.T.V.B.S Purvanchal University Jaunpur U P- 222001

[3]Department of Computer Science Engg.
Mahamaya college of Agriculture and Engg & Technology Akbarpur U P -224122

[4]Department of Computer Science Engg.
R E C Ambedakar Nagar U P -224122

Abstract: In the present investigation, the MHD couette flow of an electrically conducting fluid through a channel with highly permeable bed, has been considered in the presence of buoyancy and magneto-electric forces. The effect of the buoyancy force, permeability of porous medium, load parameter, magnetic field, on the velocity distribution, temperature field, skin-friction, flux and rate of heat transfer are discussed.

IndexTerms - MHD oscillatory flow, Temperature field, Skin friction, Load parameter, Porous medium etc.

I. INTRODUCTION:

Flow through porous media are very much prevalent in nature and therefore the study of flows through porous media has become of principal interest in many scientific and engineering applications e.g. in the field of agricultural engineering to study the underground water resources, seepage of water in riverbeds. The effect of magnetic field on the flow of a electrically conducting viscous fluid has received considerable attention due to its wide range of engineering, geophysical, astrophysical applictions. MHD channel flows have been studied extensively, including their heat transfer aspect. An excellent review of existing theoretical and experimental work on these subjects can be found in the recent books and monographs by Bejan[1], Cebeci[3], Chauhan and Vyas[4], Ingham and Pop[8], Jothimani and Anjalidevi[9], Kaviany[10], Nield and Bejan[14], Pop and Ingham[15] and Singh and Gholami[16].

Buoyancy driven convective heat transfer is of interest in relation to the underground spread of pollutants, solar power collectors, geothermal energy systems and others. In past, most of investigations have not been taken into account the effect of buoyance forces since the problems were on horizontal flows.

It was assumed that the buoyancy forces are almost negligible in horizontal flows, but some authors have shown that in the case of horizontal flow of liquids with low Prandtl number (Pr), the buoyancy forces cannot be neglected as they significantly affect the flow field. The buoyancy layer flows for such fluids have been discussed by Bejan and Khair [2]. Gholami and Singh [7] analysed the problem of simultaneous heat and mass transfer with the entire range of buoyancy ratio for most practical chemical species in dilute solutions and aqueous solutions. Yan and Chang [17] have investigated numerically the laminar mixed convective flow in the channel and simultaneous influence of the combined buoyancy effects of the thermal and mass diffusion for an air-water system. Garander *et al.*[6] proposed an analytic solution to the governing equation of MHD to be used model the effect of a transverse magnetic field on natural convection. When the fluid is electrically conduction and exposed to a magnetic field the Lorentz force is also active and interacts with the buoyancy force in governing the flow and temperature fields. Employment of an external magnetic field has increasing application in material manufacturing industry as a control mechanism since the Lorentz force suppresses the convection currents by reducing the velocities. Study and through understanding of the momentum and heat transfer in such a process is important for the better control and quality of the manufactured products. The MHD heat transfer in two phase flow with fluid in one phase being electrically conducting was studied by Lohrasbi and Sahai [12]. The problem of MHD heat transfer for short circuit case in a two-phase flow have discussed by Malashetty and Leena [13]. Firat *et al.* [5] observed the Lateral load estimation from visco-plastic mud flow.

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 06(I), pp. 33298-33303, June, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

A STUDY ON VANET AND ITS SECURITY ISSUES

[1]Krishna Verma, [2]Ritika Yaduvanshi, [1]Shashank Shekhar Tiwari, [1]Prince Rajpoot, and [1]Shivendu Mishra

[1]Department of Information Technology, Rajkiya Engineering College Ambedkar Nagar (U.P), India
[2]Department of Computer Science and Engineering, Mahamaya College of Agricultural Engineering and Technology, Akbarpur, Ambedkar Nagar (U.P), India

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1006.3646

ARTICLE INFO

Article History:
Received 6th March, 2019
Received in revised form 15th April, 2019
Accepted 12th May, 2019
Published online 28th June, 2019

Key Words:

RSU (Road Side Unit), V2I (Vehicle to Roadside Infrastructure), V2V (Vehicle to Vehicle), IVC (Inter Vehicle Communication), OBU (On Board Unit), AU (Application Unit)

ABSTRACT

Vehicular ad hoc Network or VANET is a sub form of Mobile ad hoc Network or MANET that provides us communication between vehicles and also between vehicles and road side base stations. Since we know vehicles generally proceed at a high speed, hence the network topology also changes quickly. It's an important and bright application of the Intelligent Transport System or ITS. In order to achieve safety and security in Vehicular Transportation, we can implement VANET as there happens an Inter Vehicular Communication. Also, there are many challenges when it comes about implementing VANET. This Survey Paper's goal is to provide an overview on VANETs, its Measures, Security Issues, Applications and existent VANET routing protocols.

Copyright © Krishna Verma *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

In today's life the large volume of traffic tends to affect the safety and effectivity of the whole traffic surroundings. A huge number of people died in road accidents all around the globe every year. It has always been a challenge to stop and avoid all such accidents and provide people's safety. Safety applications are very important in nature since these are directly associated to the users and their lives. One of the promising ways is providing the traffic situations to the vehicles around so that it can be used to analyze the traffic conditions of the vehicles all around which can be detected by sharing of information between them. With enhancement in the technology of microelectronics, it has now become possible to integrate nodes and network devices into a single unit and wireless interconnections [1]. VANET is one of the important applications of Mobile ad-hoc Networks (MANETs). VANET is that technology which delivers naturalistic vehicle to vehicle (V2V) and vehicle to roadside infrastructure (V2I) communications. VANET is a self-formed system in which vehicle works as node and to form these networks WIFI technologies are used. VANET is used for making an intelligent transportation system (ITS) that makes roads safer, provides traveler welfare and traffic efficiency. Achievement in VANET relies upon the essential elements like statistics routing in between nodes and the entrance to the internet. Vehicular ad hoc Networks (VANETs) lead to the foundation of Intelligent Transportation System (ITS) which is done by making vehicles able to communicate to each other through Inter-Vehicle Communication (IVC) also with safer and more efficacious roads by giving appropriate information to the drivers and interested authorities.

Simulating study area on Vehicular Network can only be done where we can bring the ad hoc system to its entire potency. When this statistical data got exchanged repeatedly on frequent times then it clearly points out towards the role of security. In order to communicate securely it is very important that the statistical data should be transmitted accurately from source to destination for the safety program. Therefore, security is such a vital issue that cannot be ignored in a case. Attackers may generate difficulties by accessing the system fully hence any kind of malicious attack can result in loss of lives and loss of money as well. Therefore, information's and data's protection are very critical in VANET system [2].

***Corresponding author:** **Krishna Verma**
Department of Information Technology, Rajkiya Engineering College

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 07(J), pp. 33957-33961, July, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

A BRIEF SURVEY ON SOFTWARE DEVELOPMENT LIFE CYCLE MODELS

Shashi Prabha Anan[1]., Esha Purwar[2]., Seema[3] and R. B. Gautam[4]

[1,2]Department of Computer Science & Engineering, MCAET, Ambedkar Nagar, India
[3]Department of Civil Engineering, MCAET, Ambedkar Nagar, India
[4]Department of Agriculture & Engineering, MCAET, Ambedkar Nagar, India

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1007.3788

ARTICLE INFO

Article History:

Received 4th April, 2019
Received in revised form 25th May, 2019
Accepted 23rd June, 2019
Published online 28th July, 2019

Key Words:

Software Performance, Verification, Validation, Risk analysis, Customer Evolution, Prototype model etc.

ABSTRACT

Software Development Life Cycle Models (SDLC) are systematic and well defined approach for problem solving; it is a series of identifiable stages that software goes during its lifetime. It practiced for developing high quality and reliable software system. In the early years, software was cheaper then hardware. In digital era, hardware is cheaper and software is expensive. So the costs of hardware and software have been reversed due to increased demand of well engineered software products so we have to develop software products due to increasing demand of software in market so for developing a software product we have to follow the models that deliver a quality software product There are many SDLC models available, but in this paper we make our attention in four SDLC models namely; Waterfall model, V shaped model, Spiral model, and Prototype model, there uses, advantages and disadvantages.

Copyright © Shashi Prabha Anan *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Every work is done with the help of a computer in real life, so we need to develop a software system that meets all user needs and is easy to use. Thus SDLC systematically and disciplined develops the project. It defines entry and exit criteria for each phase, a phase can only begin if the entry and exit criteria are met so that it becomes very difficult without using SDLC models.

A software design strategy relates to the structure used to plan, manage and control the method of creating a software system [1]. Formally, the methodology of software development is known as the SDLC abbreviate as the Software Development Life Cycle and is used in many areas, for example, engineering of software, system engineering, computation and other industrial applications.

For example, software engineering, system engineering, inform atics engineering, mechanical engineering and applied engineer ing [2].

Software was inexpensive in the early days and equipment was expensive. But now day software is costly and hardware is cheap. So the software and equipment expenses have been inverted owing to growing demand for well-designed goods.

Motivation of SDLC Models

- Encourage computer developers to use multiple SDLC designs for well-maintained initiatives.
- Encourage consciousness of software performance.
- To research the facts that influence software performance.

Phases of Software Development Life Cycle Models

Series of identifiable stages that software goes during its life cycle are:

1. Feasibility study
2. Requirement analysis
3. Design
4. Coding
5. Testing
6. Maintenance

Feasibility study: It works out on overall understanding of problem, formulates different solution and strategies, performs a cost benefit analysis, may also find none of solution is feasible due to high cost, resource constrains, technical reason.

Requirement analysis: Aim of this phase to understand the exact requirement of customer then document them properly.

Corresponding author:* **Shashi Prabha Anan
Department of Computer Science & Engineering, MCAET, Ambedkar Nagar, India

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 05(F), pp. 32540-32545, May, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

HEAT TREATMENT OF TOOL STEEL D3 AND EFFECTS ON MECHANICAL PROPERTIES

Ram Bahadur Singh, Seema and Dharmendra Kumar

MCS Group of College, Lucknow, India

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1005.3493

ARTICLE INFO

Article History:
Received 4th February, 2019
Received in revised form 25th March, 2019
Accepted 23rd April, 2019
Published online 28th May, 2019

Key Words:

Tool Steel D3, Heat treatment, Machining.

ABSTRACT

Investigation of my project is to evaluate the effects of heat treatment process on mechanical properties machinability of material. Material used for this project is Tool steel D3 and CBN insert tool is chosen for performing machining operations on CNC. Comparison of roughness has been done for before and after conventional heat treatment process. Similarly tool wear and chip morphology before and after conventional heat treatment process are also established in detail. Working conditions like cutting speed, depth of cut & feed rate are varied for different values. Mitutoyo surface roughness tester is used for before and after result comparisons. Optimisation is done using Response surface method technique. Resultant machining properties show improvement after heat treatment.

Copyright © Ram Bahadur Singh, Seema and Dharmendra Kumar, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Tool steels are the alloys which are used to manufacture the dies tools and mold, and cut other materials, including ferrous and nonferrous materials and plastics etc[1-3]. Properties of tool steel depend upon the composition of alloys therefore we can say that when we change the composition of tool steel then properties of tool steel will also change and therefore by changing the composition of tool steel we can obtain the desire properties[4-5]. Properties of tool steel also depend on the crystal structure of tool steel so we can also change the properties of tool steel by using the different type of heat treatment process because heat treatment process change the crystal structure of material such as crystal structure of steel in iron carbon diagram change from face center cubic (FCC) to body center cubic (BCC) during cooling of y-austenite ateutectoid point in iron carbon diagram [6].

Tool steel is also classified on the basic of American iron and steel institute (AISI) such as water hardening tool steel, hot work tool steel , tungsten high speed tool steel, chromium based tool steel etc. Tool Steel D3 is classified by AISI system which is chromium hot work tool steel, UNS (unified numbering system) number of tool steel D3 is T20813 which has 0.35%C, 5%Cr, 1%V, 1.5%Mo [7].

An overview of important heat treatment process Heat treatment process are used to improve the mechanical properties of material by changing the crystal structure (such as change the FCC to BCC etc.) or we can say that we can obtain desire properties of material by use of heat treatment process. Heat treatment process consist full annealing process, recrystallization annealing, stress relief annealing, spherodisation annealing, cooling process, surface hardening, case hardening, work hardening process, tempering, normalizing etc.[8-9], and heat treatment process can affect the entire work piece or only Surface or some region in material depends upon the heat treatment process and parameter used in heat treatment process. Different types of heat treatment process are almost same because all heat treatment process requires the heating and cooling process. But difference is distinguished by rate of heating and cooling. Heat treatment process is mainly three step process.

Stage 1 – heat the metal (sample) to the desire temperature and ensure the uniformtemperature
Stage 2 – hold the metal at high temperature for sufficient time period according torequirement
Stage 3 – cool the metal to room temperature

Types of Heat Treatment Process

Annealing- Annealing is used to relieve the internal stress of material and soften the material then make it more ductile and refine the structure of grains.

Normalizing: Normalizing is the heat treatment process for ferrous metals only. Normalizing less differs from annealing. In normalizing, we heat the metal to high temperature in furnace

Corresponding author:* **Ram Bahadur Singh
MCS Group of College, Lucknow, India

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 04(F), pp. 32055-32060, April, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Reveiw Article

"FAULT DETECTION OF ROTOR SYSTEM DUE TO DICS MISALIGNMENT IN FLANGE COUPLING"

Ayush Saxena, Ram Bahadur Singh and Seema

MCAET, Ambedkar Nagar (UP),India

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1004.3390

ARTICLE INFO

Article History:
Received 12th January, 2019
Received in revised form 23rd February, 2019
Accepted 7th March, 2019
Published online 28th April, 2019

Key Words:

Rotating shaft, MATLAB, ANSYS & Vibration analysis.

ABSTRACT

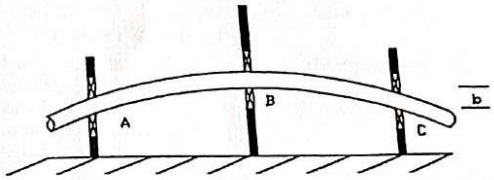
The problem of misalignment encountered in rotating machinery is of great concern to designers and maintenance engineers. On several occasions stability conditions can change the shaft alignment between the driver and driven machines. Owing to high speed of rotating machinery, a good understanding of the phenomena of misalignment is becoming necessary for maintenance engineers for troubleshooting. Mostly, rotating equipment consists of a driver and a driven machine. Coupled through a mechanical coupling. Rigid mechanical coupling are widely used in rotating machinery to transmit torque from the driver to the driven machine. When two connected machines are under misalignment, they produce higher vibrations to the machine assembly. In this study an analysis of rigid flange coupling is done. The two dimensional analysis of whole system having flanged coupling was performed numerically using MATLAB programming in order to detect faults from unbalanced and misaligned parts. The results are compared with the experimental results obtained from literature and were in good agreement. Moreover a frequency plot obtained from MATLAB of aligned and misaligned shaft was compared to detect faults in the design. Thus after detection of fault using MATLAB, rpm of shaft is varied and its effects on whole coupling system are noted. While the three dimensional rigid coupling model was analyzed in ANSYS in order to determine stress and model frequencies under normal and misaligned condition. The results were in good agreement with literature study. The healthy system in ANSYS was considered to be of bonded nuts and bolts while in misaligned Flange model nuts and bolts were given frictional contacts.

Copyright © Ayush Saxena, Ram Bahadur Singh and Seema, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Misalignment is an important cause of vibration problems in rotating machinery. Misalignment in the context of this thesis includes any deviation from the ideal case in which a straight shaft rotates in perfectly aligned bearings [1-3]. Thisstudy performs a survey on the various types of misalignments often encountered in rotating machinery and the vibrational characteristics which arise due to these misalignments are examined. In particular lateral, axial and angular coupling misalignments will be studied as a function of flexible coupling vibrational behavior [3-4].

A single uncoupled rotor may exhibit vibration problems for a variety of reasons. Sources of these vibrations may include shaft bearing misalignments, bowed rotors and mass unbalance. Bearing-shaft misalignments may from the vibrational analysis point of view be the hardest to detect. A shaft-bearing misalignment occurs when the bearing Journal placements are not axially concentric and a straight shaft is forcefully fitted into the bearings. An extreme case of a shaft distorted by bearings not axially aligned. The forces exerted by each of the bearing foundations cause the shaft to bend. As this forcefully bent shaft rotates, the forces exerted by the foundations remain constant as the shaft rotates at its operating angular velocity.



Shaft Alignment

Shaft alignment is a process where two or more shafts are aligned within permissible margin when the shafts are connected with the help of suitable coupling. It is mandatory to align the shafts within this permissible margin before the machinery is put in service.

***Corresponding author:* Ayush Saxena,**
MCAET, Ambedkar Nagar (UP),India

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 03(C), pp. 31357-31363, March, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

COMPARATIVE ANALYSIS OF CONTROLLERS DESIGNED FOR A LOAD FREQUENCY CONTROL

Ashish Gupta[1], Yashi Gupta[2], Akash Deep Gupta[2] and Maurya K. K[2]

[1]Department of Electrical Engineering Graphic Era University, Dehradun, Uttarakhand, India
[2]MCAET, Akbarpur, Ambedkarnagar, Uttar Pradesh, India

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1003.3244

ARTICLE INFO

Article History:
Received 06th December, 2018
Received in revised form 14th January, 2019
Accepted 23rd February, 2019
Published online 28th March, 2019

Key Words:

PID Controller; Tuning methods; Internal Model Control (IMC); Direct Synthesis (DS); First order filter.

ABSTRACT

This study presents the analysis of control techniques of PID tuning parameters for load frequency control (LFC) of power system in order to maintain the frequency regulation. There are five tuning techniques is used to cognize the problem of load frequency control such as Ziegler-Nichols (ZN), Honeywell Tuning, Internal Model Control (IMC) based PID Controller Direct Synthesis (DS) and IMC based PID controller with first order filter. The primary attention of this paper is to collate these tuning techniques for single input and single output (SISO) system using MATLAB SIMULINK and using the model order reduction techniques with the help of ROUTH approximation, SKOGESTAD method and TAYLOR approximation method. third order system's LFC abolished into second order model, second order plus dead time (SOPDT) model and first order plus dead time (FOPDT) model by using this three MOR techniques. This paper identified the comparative dissection of execution diagnosis of isolated response entire in the indication of time and frequency response specification. It is accomplished that Inter Model Control based PID Controller with first order filter demonstrate the better performance comparatively.

Copyright © Ashish Gupta *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Load frequency control (LFC) has a basic control structure or arrangement, of parts of the machine and similar devices in term of power system operation and control. Load frequency control use to keep the uniform frequency during changing load. When system frequency is changed, the main problem is that the system output of generating units cannot be controlled with in specified limit is called Load frequency control (LFC) [1]. Reasonable to extensive power, insolubility is extended of contemporaneous power system, sublimated and predicted control prescripts are proficient in load frequency control; e.g. conventional control [2-3]; variable structure control [4]; self-tuning control [5] intelligent control [6]; optimal control [7-8]; adaptive control [9]; robust control [10-11]; and advanced fuzzy and ANN controller [12-14] etc. Improved performance is expected from the advanced control method [15] required to get knowledge on the system or to identify an online recognizer parameters. It does not apply in practical PID controller for load frequency control study due to their simplicity. Power system with various commercial and industrial loads and rotating mass with the help of turbines, Governors and Generator with loads required to perform at a uniform and invariable frequency. So Load frequency control is an extremely significant and specific crux in Power system operation, process, influence and control with good quality, to provide sufficient, easy, a dependable and accuracy electrical power. When demand is increased due to manufacturing, the electrical power is becoming complex and complicate. For satisfactory networks operation the frequency controlled and remains nearly uniform. As the load varies at single, double and multi areas with Power system, the frequency relates to work multi areas affect through Tie lines. A premeditating and changing frequency transients and load execution appliance disservice instruments, when the transmission lines are overloading and overcharge, networks fully antagonized to preserve the equipments, so that tuning controllers are designed to protect the system's equipments. This is an unsteady and instability circumstances for the electric Power system. Controllers are designed to control the unstable condition and maintain the frequency. The primary point is that, when the Load frequency controller is deflected unsettled circumstances of the system, Power system will be stable. All conditions and equipment (loads, governor and turbine) of the Power system is digested [16]. It is a main role to fulfill the application of Power system, When the active power and reactive power is

*Corresponding author: **Ashish Gupta**
Department of Electrical Engineering Graphic Era University, Dehradun, Uttarakhand, India

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 03(E), pp. 31472-31481, March, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

PERFORMANCE EVALUATION OF LOAD FREQUENCY CONTROL WITH DIFFERENT TECHNIQUES WITH PID CONTROLLER

Ashish Gupta, A. D. Gupta, Yashi Gupta and R. K. Mehta

Mahamaya College of Agriculture Engineering and Technolgy

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1003.3267

ARTICLE INFO

Article History:
Received 15th December, 2018
Received in revised form 7th January, 2019
Accepted 13th February, 2019
Published online 28th March, 2019

Key Words:

PID Controller; Tuning method; IMC based PID Contrpller; First order filter, Robust PID Controller , set point and Disturbance Rejection.

ABSTRACT

Load frequency control (LFC) play a vital role in order to maintain the frequency regulation in power system. This study shows a comparative analysis of PID controller tuning methods for load frequency control in power system. Six tuning methods namely Ziegler-Nichols Method (Z-N), Tyreus-Luyben Method, Internal Model Control (IMC), Direct Synthesis Method (DS), Robust PID Controller and Optimum PID tuning for set point changes and Disturbance Rejection is adapted to evaluate their performance and used to solve the problem of load frequency control. In this paper higher order single input and single output (SISO) system is carried out with the help of Routh Approximation Method (- expansion) and Pade Approximation Method to reduce second order model model. The performance analysis is compared to time response specification such as maximum peak overshoot, settling time, rise time and peak time and it is observed that Inter Model Control based PID Controller with first order filter exhibit better performance comparatively.

Copyright © Ashish Gupta *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The Power system has a long history of the trouble with the Automatic Generation Control (AGC) or Load Frequency Control (LFC) and is one of the sincerely fundamental two of researches with methodical exploration and perusal of objects and sources in order to install facts and approach new inferences of interconnected power systems. As an auxiliary service in a power system, load frequency control plays an important and fundamental role in maintaining the reliability of the power system at a reasonable level. It has been gained importance with the change in the structured of the electrical power system and growth of size and complexity of interconnected systems [1-5]. For comprehensively electrical power system, the unified and interrelated control areas are composed to load frequency. It is crucial to hold the frequency and distinction surface tie power with calculated significance power. Input mechanical power has been employed to control the frequency of the generator, variation and transformation in frequency and tie-line power, which is a measure to shift and variation in the rotor angle. A well-prepared power system should be able to provide an acceptable level of power to maintain the magnitude of the frequency and voltage within satisfactory boundaries. Some changes in the electrical power system, load especially affected the system frequency, while the reactive power is shorted susceptive to change in the frequency and is mainly subordinate on the motility of the voltage magnitude. Therefore, the control of active and reactive power in the electrical power system is trade separately. So weight frequency control is mainly related to system frequency and actual power control, while the automatic voltage regulator loop controls is used to change in the reactive power and voltage appearance and magnitude. Load Frequency control is an elevated level of many promotions and advanced concepts, which governs the dimensions of the electrical power system. Load Frequency Control (LFC) has a basic control structure or arrangement, of parts of the machine and similar devices in term of power system operation and control. Load Frequency Control use to keep the uniform frequency during changing load. When system frequency is changed, the main problem is that the system output of generating units cannot be controlled with in specified limit is called load frequency control (LFC) [6-8]. The speed depends on the frequency of the alternative current power supply. These are the main situation when speed permanence is required to be higher order. Electrical chronometers are operated by synchronous motors. The precision of the chronometer do not depend only on the frequency but the integral part of the frequency error. If the normal frequency of any network is 50 hertz, and the network frequency falls below 48.5 hertz, and goes to high level 51.5

Corresponding author:* **Ashish Gupta
Mahamaya College of Agriculture Engineering and Technolgy

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 01(A), pp. 30208-30213, January, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

A NOVEL PID CONTROLLER DESIGN TECHNIQUE FOR LOAD FREQUENCY CONTROL

Ashish Gupta., Yashi Gupta., Akash deep Gupta., Rakesh Babu Gautam and Shashi Prabha Anan

Mahamaya College of Agricultural Engineering and Technology, Akbarpur Ambedkarnagar, ND University of Agriculture and Technology, Kumarganj, Ayodhya-224229

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1001.3010

ARTICLE INFO

Article History:

Received 13th October, 2018
Received in revised form 11th November, 2018
Accepted 8th December, 2018
Published online 28th January, 2019

Key Words:

PID Controller; Tuning method; Internal Model Control(IMC); Direct Synthesis(DS)

ABSTRACT

A PID tuning method for load frequency control (LFC) of Power system discuss in this paper. The tuning method is based on the Ziegler-Nichols (ZN), Tyreus-Luyben(TL), Internal Model Control (IMC) and Direct Synthesis(DS) method. Our purpose in this study is comparison of these tuning methods for single input and single output (SISO) system using Matlab simulink and comparatively analysis of performance evaluation of different controller. Such as percentage of Maximum overshoot, Settling time, Rise time, Peak time has been used as the criterion for comparison of SISO system and these tuning methods have been implemented for FOPDT(First-order-plus-dead-time) model, SOPDT(second-order-plus-dead-time) model and higher order system.

Copyright © Ashish Gupta *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Load frequency control (LFC) has a basic control structure or arrangement, of parts of the machine and similar devices in power system operation and control. Load frequency is used to keep the uniform frequency during changing load. When system frequency is changed, the main problem is that the system output of generating units can not be controlled with in specified limit is called Load frequency control (LFC) [1]. Due to increased complexity of modern power system, advanced control methods are used in load frequency control; e.g. Variable structure control[2]; intelligent control[3]; optimal control[4]-[5]; adaptive and self tuning control[6]; and robust control[7]-[8]. Improved performance expect from the advanced control method required to collect information on the system or to identify online identifier parameters. It is very difficult to apply in practical PID controllers for load frequency control study due to their simplicity. Power system with various commercial and industrial loads and rotating mass with the help of turbines, Governors and Generator with loads required to perform at a uniform and invariable frequency. So Load frequency control is a extremely significant and specific crux in Power system operation, process, influence and control with good quality, to supply sufficient, easy, reliable and accuracy electric power. With rising demand, the electric power is becoming complex and complicated. For satisfactory networks operation the frequency controlled and remain nearly uniform. As the load varies at single, double and multi areas with Power system, the frequency relates to work multi areas affect through Tie lines. A measured frequency transients and load performance equipment damage apparatus, when the transmission lines are overloading, networks fully interfered to protect the equipments, so that tuning controllers are designed to protect the system's equipments. This is a unsteady and instability circumstances for the electric Power system. Controller are designed to control the unstable condition and maintain the frequency. The main point is that, when the Load frequency control removes unstable conditions of the system, Power system will be stable. All conditions and equipments (loads, governor and turbine) of the Power system are set. Therefore the system growth Power quality [9]. It is a important role to fulfill the application of Power system, When the active power and reactive power is controlled it and controller are use to control equipment for safety purpose, active power is directly proportional to system frequency in the

*Corresponding author: **Ashish Gupta***
Mahamaya College of Agricultural Engineering and Technology, Akbarpur Ambedkarnagar, ND University of Agriculture and Technology, Kumarganj, Ayodhya-224229

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 10, Issue, 03(D), pp. 31408-31412, March, 2019

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

THERMAL PERFORMANCE ANALYSIS OF A PACKED BED SOLAR AIR HEATER HAVING ROUNDED TIP V-GROOVED ABSORBER

A. D. Gupta*, Ashish Gupta, L. Varshney and Yashi Gupta

Mahamaya College of Agriculture Engineering and Technolgy

DOI: http://dx.doi.org/10.24327/ijrsr.2019.1003.3253

ARTICLE INFO

Article History:
Received 6th December,, 2018
Received in revised form 15th January, 2019
Accepted 12th February, 2019
Published online 28th March, 2019

Key Words:

solar collector, rounded tip V-grooved collector, packed bed

ABSTRACT

The thermal efficiency of conventional solar air collectors is found to have low thermal efficiency mainly due to higher top losses and low heat transfer rate from absorber plate to flowing air due to low specific heat of air. Use of packed bed solar collector helps in reducing the top layer temperature by absorption of heat energy in depth, thus minimizing the top losses. Also, heat transfer coefficient between the packing element and flowing air is increased as a result of air flows through the tortuous path. Heat transfer area is also increased in packed bed air heaters. Overall effect is the enhanced thermal efficiency of the collector along with increased pressure drop. Rounded V-grooved absorber plate have also been used for increasing the thermal efficiency of conventional smooth collectors taking advantage of large amount of intercepted radiation on the absorber plate, without any increase in the pressure drop. Use of rounded V-grooved absorber plate is made in packed bed air heaters in the present investigation which is found to further increase thermal efficiency of a packed bed collector, without additional pressure drop penalty in packed bed.

Experiments are conducted on a solar collector under simulated conditions using wire screen matrices in its air flow duct for varying operating parameters. It has been observed that the maximum thermal efficiency of 85.2% with outlet temperature of 56.1 oC is obtained at a mass flow rate of 0.035 kg/s.m2 and a fixed insolation of 1100 W/m2. These results in thermal efficiency enhancement by approximately 65% compared to the conventional smooth collector. For a mass flow rate of 0.015 kg/s.m2, the increase in efficiency has been found to be 46% higher compared to conventional collector for same value of insolation with air outlet temperature of 68.9 oC

It is seen that the efficiency of the collector increases with increase in mass flow rate and insolation. It has been found that geometry of absorber plate significantly affects the performance of the collector.

Copyright © A. D. Gupta *et al*, 2019, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The fast depleting conventional energy resources and problems regarding pollution and global warming have made it inevitable to think about cleaner and sustainable form of energy. One such form of energy is solar energy, which has got great potential especially for countries like India because of abundant insolation available due to their geographical location. The utilization of this form of energy can easily be achieved for low temperature applications using flat plate solar collectors, which have a wide range of applications viz. domestic and industrial water heating, drying of agricultural products such as fruits and grains, green house chambers, space heating, solar refrigeration and air conditioning etc. Conventional solar air collectors have inherent disadvantages viz low thermal efficiency due to low value of specific heat of air. In order to increase the thermal efficiency of conventional collectors different techniques have been proposed for thermal performance improvement [1-6]. These techniques include enhancement of heat transfer coefficient between absorber plate to working fluid and reduction of top losses etc.

The enhancement of heat transfer coefficient can be achieved in several ways, such as the use of artificial roughness which disturbs the viscous boundary layer of the flowing fluid and thus augmenting the heat transfer rates. Use of finned plate absorber surface causes an increase in the turbulence of air flowing through the duct, increasing the thermal performance with limited increase in pressure drop. Use of rounded tip V-grooved absorber plate proves to be beneficial in increasing the effective absorbing area as compared to the conventional collectors. This effectively increases the absorbing area and the amount of incident solar radiations collected by the absorber plate. Use of packed bed solar air heaters is another approach to

Corresponding author:* **A. D. Gupta
Mahamaya College of Agriculture Engineering and Technolgy

Article AR1948
DOI: HTTPS://DOI.ORG/10.23910/IJBSM/2019.10.2.1948
International Journal of Bio-resource and Stress Management
April 2019
Crossref
Print ISSN 0976-3988
Online ISSN 0976-4038
IJBSM 2019, 10(2):166-170
Research Article
Natural Resource Management

An Assessment of Fuel from Disposed Plastic Containers for Diesel Engine

A. D. Gupta[1*], Ashish Gupta[1], Seema[1] and L. Varshney[2]

[1]Mahamaya College of Agricultural Engineering & Technology, NDUAT, Ayodhya, U.P. (224 229), India
[2]G. B. Pant University of Agriculture and Technology, Pantnagar, U.S. Nagar, Uttarakhand (263 145), India

Open Access

Corresponding Author
A. D. Gupta
e-mail: ct40964p@gmail.com

Citation: Gupta et al., 2019. An Assessment of Fuel from Disposed Plastic Containers for Diesel Engine. International Journal of Bio-resource and Stress Management 2019, 10(2):166-170. HTTPS://DOI.ORG/10.23910/IJBSM/2019.10.2.1948

Copyright: © 2019 Gupta et al. This is an open access article that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Data Availability Statement: Legal restrictions are imposed on the public sharing of raw data. However, authors have full right to transfer or share the data in raw form upon request subject to either meeting the conditions of the original consents and the original research study. Further, access of data needs to meet whether the user complies with the ethical and legal obligations as data controllers to allow for secondary use of the data outside of the original study.

Conflict of interests: The authors have declared no conflict of interests exist.

Acknowledgement: Author(s) acknowledge the supports from Mahamaya College of Agricultural Engineering & Technology, NDUAT, Ayodhya, U.P. (224 229), India

Abstract

The present work is focused on the methodology for production of alternative fuel for automobile engines along with waste material management. This is done using pyralysis, which is a technique used to produce liquid fuel from solid waste material using a reactor unit. In the present investigation, an electrically operated pyrolysis reactor unit with thermostat (a temperature control device) with water-cooled condenser is used for the pyrolysis process. An attempt is made to obtain the pyrolysis oil from the waste plastic bottles disposed of after use. Used plastic bottles are collected from various places like railway station, restaurants and other places where disposable water bottles and other plastic containers are thrown away. These plastic bottles and containers are initially washed for removing impurities and then dried in the open air for about two days. In the experimental process, 2.5 kg of crushed bottles are taken and using pyrolysis reactor unit these are converted into oil. Brown colored oil produces after the process is collected. Various ignition properties of the pyrolysis oil obtained are evaluated and analyzed. Important characteristics of the fuel obtained from the pyrolysis process are compared with the high-speed diesel. It is observed that the obtained pyrolysis oil has properties similar to the high-speed diesel. Experimental investigation reveal that ignition properties of the pyrolysis oil are suitable for use in diesels engine with minor design modifications.

Keywords: Pyrolysis oil, alternative fuels, dissipated containers, fuel properties

1. Introduction

The demand of the petroleum product is increasing day by day. The natural resources of petroleum fuel are limited and going on depleting very fast. So, it's need of the hour to find the new alternates of these fuels. These finite resources of petroleum are highly concentrated in certain regions of the world have given rise to uncertainty in its supply and price and are impacting growing economies of countries like India, where imports approximately 70% of the total demand for crude. Table1 clearly indicates that India's petroleum product consumption has increased from 1×10^9 tons in 2001-02 to 1.3×10^9 t in 2008-09 at a CAGR of 4.1% and is likely to increase up to 2.2×10^9 t by 2020- 21 and 3.3×10^9 t by 2030-31, resulting in the steep rise of under-recoveries of oil marketing companies at current levels of crude prices. This makes it difficult for the government to subsidize petroleum products in the future. Around the world, there are initiatives to replace gasoline and

Article History
RECEIVED in 12th January 2019 RECEIVED in revised form 29th April 2019 ACCEPTED in final form 30th April 2019

Shot on OnePlus
Ambedkar Nagar, Uttar Pradesh 2022.07.27 11:12
By sachin Y.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 6, Issue 5, May 2019

Randomness in Circular - Complex Extreme Learning Machine Vs Voting Based Extreme Learning Machine with Accuracy Based Ensemble Pruning: A Review

Ashish Gupta

Department of Computer Science and Engineering,

Mahamaya College of Agricultural Engineering and Technology, Ambedkar Nagar, Uttar Pradesh, India

Abstract: Extreme Learning Machine is a fast single layer feed forward neural network for real valued classification. It suffers from the problem of instability and over fitting. Extreme Learning Machine (ELM) has recently emerged as a fast classifier giving good performance. Voting based Extreme Learning Machine; VELM reduces this performance variation in Extreme Learning Machine by employing majority voting based ensembling technique. Circular–Complex Extreme Learning Machine (CC-ELM) is recently proposed complex variant of ELM which has fully complex activation function. It has been shown that CC-ELM outperforms real valued and other complex valued classifiers. In both CCELM & ELM parameters between input and hidden layer are initialized randomly and the weights between hidden and output layer are obtained analytically. Due to this randomization, the performance of both ELM & CC-ELM fluctuates. In this paper, performance fluctuation due to random parameter of CC-ELM and the circular transformation function have been analyzed first, then by using an Ensemble approach namely Bagging, a variants Bagging.C1 is proposed to bring the stability in the performance of CC-ELM. In Bagging.C1 various data samples are generated by using random parameters of circular transformation function. This work further proposes and evaluates Voting based Extreme Learning Machine with Accuracy based ensemble Pruning, VELM_AP. VELM_AP generates component classifier in the same way as VELM. Performance of proposed classifier ensemble is evaluated using a set of benchmark real-valued classification problems from the University of California, Irvine machine learning repository.

Keywords: Classification, Complex-Valued Neural Networks, Extreme Learning Machine, Ensemble Pruning

I. INTRODUCTION

Extreme learning machine is a fast classifier with a good prediction ability which was recently proposed by Huang et al [1]. It is a single layer feed-forward neural network in which the input weights and hidden layer biases are initialized randomly and the weights between hidden layer and output layer are determined analytically using Moore-Penrose generalized inverse H† of the output matrix of hidden layer. Unlike other traditional gradient descent learning algorithm such a back propagation ELM does not require tuning of the parameters like learning rate, learning epoch etc and can provide better performance in terms of learning speed, reliability and generalization Tian et. al [2]. It does not have to encounter problems like stopping criteria and local minima Wang et. al. [3].

With the evolution of technologies that include the processing of complex-valued signals like, signal processing, adaptive array processing [4], image processing [5] it has been a necessity to create and develop complex-valued neural networks. R.Savitha et. al [6] proposed a Fast learning circular complex valued extreme learning machine (CC-ELM) for the classification of real valued data sets in complex domain.CC-ELM uses sin(z) as circular transformation function and sech() as fully complex Gaussian type activation function. Circular transformation function, an orthogonal decision boundary of CC-ELM at hidden layer and output layer shows better performance and prediction ability of real valued data than ELM and various complex valued classifiers [7]. Various variants of ELM also have been proposed in literature to enhance the performance like OS-ELM [8], I-ELM [9], W-ELM [10], C-ELM [11] etc. However these variants could not address some drawbacks of ELM [12] which are mentioned below:

1. The ELM and its variants randomly select the input weights and the hidden layer bias. This causes instability in the predictions of ELM.
2. The ELMs suffer from the over fitting problem. This is due to more number of hidden nodes on larger datasets and the complexity of the input instances distribution.
3. When the size of the dataset increases the order of the matrix H also increases. This implies that when larger datasets are used large memory is required to calculate the Moore-Penrose inverse.

Shot on OnePlus
Ambedkar Nagar, Uttar Pradesh 2022.07.27 11:11
By Sachin Y

Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 3825-3829

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-11 pp. 3825-3829**
Journal homepage: http://www.ijcmas.com

Original Research Article

Management of *Fusarium wilt* of lentil through seed treatment with fungicide, botanicals and bio-agents alone or in cocktail

Subhash Chandra[1*], Rajeev Kumar[1], Ajay Kumar[2], Abhimanyu[3], Ramesh Chand[1] and Rajendra Prasad[1]

[1]Department of Plant Pathology,
[2]Department of Plant Pathology, Amar Singh P.G. College, Lakhavaoti, Bulandshahar, Uttar Pradesh, India
[3]Department of Plant Protection, Krishi Vigyan Kendra, Farrukhabad, Chandra Sekhar Azad University of Agriculture and Technology, Kanpur, Uttar Pradesh, India
**Corresponding author*

Keywords

bio-agents, botanicals, Fusarium, management, wilt

ABSTRACT

Fusarium wilt is one of the major diseases in lentil crop which causes a significant yield loss. The present study aimed to manage the *Fusarium wilt* of lentil through seed treatment with fungicide, botanicals and bio-agents alone or in combination which is carried out at Student Instructional Farm of ANDUAT, Kumarganj, Ayodhya. It was observed that Minimum disease incidence was found in T_8 Metalaxyl 8% + Mancozeb 64% + Neem leaf extract (10%) + *T. viride* (14.13 %) with per cent disease control (82.76) followed by T_3 Metalaxyl 8 % + Mancozeb 64 % + *Trichoderma viride* (15.85 %) having PDC (80.67), T_2 Metalaxyl 8 % + Mancozeb 64 % + *Trichoderma harzianum* (22.37%) having PDC (72.71), T_7 Metalaxyl 8% + Mancozeb 64% + Neem leaf extract (10%) (28.84%) having PDC (64.82).

Introduction

Lentil (*Lens culinaris* Medik) commonly known as Masur was among the first crop domesticates and has become an important pulse crop in the farming and food system of many countries globally (Sarker and Erskine, 2006). Lentil also known as 'Poor man's meat' as it is rich in nutrients, include 60-67% carbohydrates, 20-36% protein, <4% lipid, and 2-3% ash on dry weight basis (Bhatty, 1988). Major lentil growing states in India are Madhya Pradesh (42.50%), Uttar Pradesh (31.25%), West Bengal (9.38%) and Bihar (8.75%). In India, lentil was grown in 1.49 mha with production of 1.61 mt with an average production of 1006 kg/ha (Anonymous, 2018).

Among biotic factors disease are major constraint in lentil production. Among the fungal diseases, Fusarium wilt of lentil caused by *Fusarium oxysporum* f.sp. *lentil* is a major threat in lentil production worldwide (Bhalla *et al.*, 1992). In India, this disease causes significant yield losses in various states of India where lentil is grown. The fungus is soil and seed borne and also

Scanned with CamScanner

Short Communication *Ann. Pl. Protec. Sci. 27 (2) : 302-307 (July, 2019)*

doi: 10.5958/0974-0163.2019.00062.4

Identification of Lentil genotypes resistant to *Fusarium oxysporum* f. sp. *lentis*.

Subhash Chandra, Neeraj Kumar Rajvanshi and Ramesh Chand*

*Department of Plant Pathology, *Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya – 224 229 (UP), India*
<chandrasubhash75@yahoo.in>

Date of Receipt: 06.05.2019; Accepted: 16.06.2019

Lentil (*Lens culinaris* Medik L.) is one of the most important pulse crop in India and mostly grown in north east plain zone and central part. It is a diploid and self-pollinated crop which is grown in winter season. Lentil suffers from attack of a number of diseases such as vascular wilt; collar rots, root rot, stem rot, rust, powdery mildew downy mildew and fusarium wilt which are caused by

Table 1. Performance of Lentil genotypes against *Fusarium oxysporum* f. sp. *lentis* in field screening during *Rabi* season

Rating scale	Reaction	No. of genotypes	Name of genotypes
1	Highly resistant	49	IPL 534, IPL 224, IPL 328, IPL 223, PL 141, SKUL 2-96, LL 1266, IPL 327,LL 1223, RKL 604-01, RKL 607-01, L 4147, VL 521, LL1114, PL 135, RKL 606-09, PL 117, L 4593, EC 1, PL 146, LH 84-8, LH 08-10, IPL 81, L 4708, VL 145, L 4592, L 4710, HUL 57, KLS 09-5, IPL 321, L 4711, IPL 219, IPL 215, L 4076, IPL 315, IPL 324, IPL 513, IPL 316, IPL 526, IPL 220, IPL 225, PL-129, LL-1231, RLS 113, L-4707, L-4588, VL-142, VL- 143, RLG 147.
3	Resistant	34	NDL 12-1, K-75, IPL 529, RLG-109, VL-138, LL-1136, IPL-319, LL-1187, KLB-104, L-4704, LL-1135, KLS-107, DPL-62, IPL-531, SL-28, KLS 122, L-4702, RLG-112, KLB 314 HPLC-649, PLO-097, LL-1161, L-4076, L-4688, VL-134, NDL7-402, VL- 516, IPL-314, VL-515, DL-11-5, DPL-15, KLS 113, PL 639, LH O7-27.
5	Moderately resistant	15	NDL 12-1, KLB 343, IPL-533, NDL 11-2. NDL-7-401, NDL 6-1-10, RLG-73, IPL-314, VL-133, LL-1020, L-4589, LH 07-27, L-4595, IPL-325, PLO-98.
7	Susceptible	20	IPL 326, IPL 222, LL 1161, RLG 156, IPL 533, IPL 406, DPL 15, IPL-219, IPL-406, IPL-81, LL1210, PL-101, PL-104, VL- 521, LH-484-8, LH 08-10, NDL-11-1, L-4591, DPL-62, KLB102.
9	Highly Susceptible	32	IPL 532, RL 3, LL 1255, NDL 12-2, SKUL 9, RKL 604-5, IPL 529, LL 1203, L 9-12. IPL 220, IPL 325, IPL 221, KLS 113, RLG 147, VL 522, KLB 121, DPL 62, L 4709, LL 1203, RVL -48, KLB-314, L- 4590, DL-11-4, L-4706, PL-122, PL-099, IPL-221, IPL-318, IPL-532, IPL-215, HUL-57, RL-G109.

Scanned with CamScanner

doi: 10.5958/0974-0163.2019.00064.8

Evaluation of Pigeon pea genotypes for resistance to *Fusarium* Wilt

Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar, Kumari Punam* and Ramesh Chand**

*Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya – 224 229 (U.P.), *Department of Botany, J. P. University Chhapra (Bihar)*
***Department of Nematology, ND.U.A.&T., Kumarganj, Ayodhya – 224 229(U.P.), India*
<chandrasubhash75@yahoo.in>

Pigeon pea (*Cajanus cajan* L.) is widely adaptable to wide variety of climate and is one of the important legume crops of tropics and subtropics. It played a major role in nutritional security for the people taking cereal based diet. Beside their dietary value and nitrogen fixing ability, pulses also play an important role in sustaining intensive agriculture by improving physical, chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeon pea in India leading to heavy production losses. The *F. udum* is host specific to pigeon pea (Patel *et al*., 2011) and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. For developing resistant varieties, resistant source are the basic requirement. Therefore, the present investigation was undertaken.

Seeds of 58 germplasm of Pigeon pea were obtained from the Department of Genetics and Plant Breeding, N.D.U.A.&T., Ayodhya and ICAR-IIPR, Kanpur. The germplasms were screened under sick plot technique. The plots (sick soil) showed over 90% wilt incidence in susceptible cultivar Bahar of Pigeon pea was used as test variety. After germination, observations were recorded regularly up to 60 days for the appearance of wilt symptoms and severity. The disease was recorded using 1-9 scale for the wilt disease.

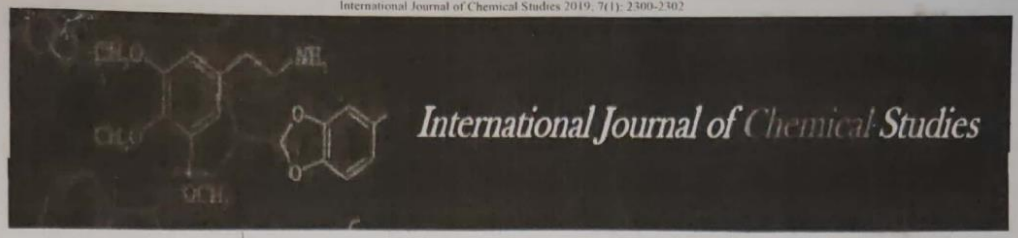
Fifty eight germplasms of Pigeon pea were screened for their reaction to *Fusarium udum* in sick plot. It is evident (Table 1) that out of 58, 6 germplasms *viz*.; AKT 201030, IPA 96, IPAF, IPA 204, JSA 59 and WRGE 18 were found resistant, attributing to the higher concentration of phenol as observed by Haldar and Srinivasan (2007), 5 moderately resistant, 10 tolerant, 16 moderately susceptible and 21 germplasm were highly

Table 1. Performance of Pigeon pea genotypes against *Fusarium udum* under field condition (Sick plot technique)

Reaction (Rating scale)	Name of the genotypes
Resistant (1)	AKT201030, IPA96, IPAF, IPA204, JSA59, WRGE18.
Moderately resistant (3)	IPA9F, IPA204, ICP8863, WRGE18, BDN2.
Tolerant (5)	IPA13F, AL1573, H2001-4, HDM04-1, UPAS120, GRG206, JKM197, PT02-9, IPA2F, IPA4F.
Moderately susceptible (7)	IPA12F, WRG123, JKM206, JKM208, PT02-5, PT25-6, AL1514, AL1571, PA325, PT05-37, WPB205, AKT222560, ASI106, JKM209, NDA05-1, WRGE42.
Highly susceptible (9)	IPA11F, IPA14F, IPA15F, IPA34, IPA234, JSA28, PA322, PT01-27, BAHAR, PUSA2006-2, SKN205, WRGE56, CORG990015, PT05-36, IPA1F, IPA3F, IPA5F, IPA5-2, IPA5-3, IPA6F, IPA7F.

Scanned with CamScanner

International Journal of Chemical Studies 2019; 7(1): 2300-2302



P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 2300-2302
© 2019 IJCS
Received: xx-11-2018
Accepted: xx-12-2018

Ramesh Chand
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Kumar Verma
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Shyam Babu Gautam
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Vinay Kumar Verma
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Ramesh Chand
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on the life cycle of *Meloidogyne graminicola* on rice and wheat crop

Ramesh Chand, Manish Kumar, Vipin Kumar Verma, Shyam Babu Gautam and Vinay Kumar Verma

Abstract
The experiment work was carried out at Narendra Deva University of agriculture and technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.) during the year 2016-2017. Studies on the management of rice root-knot nematode, *Meloidogyne graminicola* revealed that the larvae of *M. graminicola* complete their life cycle within 20 days on rice plant var. Jaya and take 23 days on wheat variety PBW-154, further is also revealed that wheat varieties support less number of nematode populations as compared to the rice varieties under Studies.

Keywords: rice, wheat, *Meliodogyne graminicola*, life-cycle

Introduction
Rice (*Oryza sativa* L.) is the staple food of a vast majority of the population in the East and South East Asian, African and South American countries. In addition to its direct food value, rice grain is used in manufacturing of several industrial and commercial products. The paddy is most important cereal crop in India occupying 44.48 million hectares of area with an annual production of 112.91 million tones with the productivity of 19.56 quintals per hectare during 2017-18. Rice is grown in diverse environment either as a sole crop (rainfed, irrigated or deep water) or as major component in various cropping systems. Cropping systems, involving different year specific crop sequences or fallow in a given area, create conditions of varying favorability for microbes and weeds and thus affect the flora and fauna. Since, rice cultivation cover large area in India, even a smallest pest problem would have great impact on yield and farmers' income. Soil borne diseases are becoming increasingly important in the rice-based cropping systems. One of the most important soil born pests is plant parasitic nematode in rice crop. About 300 nematode species belonging to 35 genera have been reported infesting rice. Among them, *Meloidogyne graminicola* (Golden and Birchfield) is considered as most important constraint in rice production. *Meloidogyne graminicola* reduce rice yield by more than 17% in a greenhouse experiment and the yield losses might go as high as 98% (Bridge & Plowright 1990) [2] in pot experiment under favorable conditions. To prevent further yield losses and improve productivity, it is necessary to find out the effective sustainable management strategy. Many species of *Meloidogyne* have been reported by various scientists throughout world. *M. graminicola* is reported as an important nematode pest of rice from countries like South East Asia, Burma, Bangladesh, Laos, Thailand, Vietnam, India, China, Philippines, Nepal and USA. *Meloidogyne oryzae* an another species of this genus is also reported on irrigated rice from Surinam and *M. incognita* is reported from Costa Rica, Cuba, Egypt, Ivory Coast, Nigeria, South Africa and Japan, *M. javanica* in Brazil, Egypt, Comoro Islands, Nigeria and Ivory Coast. Apart from this *M. arenaria is reported from* Nigeria, Egypt and South Africa and *M. salasi* in Costa Rica and Panama on upland rice.
The root-knot nematode is making its importance felt in almost all the rice growing areas. *M. triticoryzae* infecting rice including some monocot weeds is also reported from India Upadhyay V., (2014) [8] and its occurrence is restricted to a few areas. In India, *M. graminicola* is the dominant species infecting rice. *M. graminicola* has been found infecting rice in different parts of India namely, Assam, Andhra Pradesh, Karnataka, West Bengal, Orissa, Kerala, Tripura and Madhya Pradesh. *M. graminicola* is a serious pest of upland rice Panwar & Rao (1998) [5, 10] and nurseries world over in well drained soils. The nematode was reported on irrigated rice in Andhra Pradesh and Karnataka. The nematode can infect and multiply on semi-deep or deepwater rice also. *Meloidogyne graminicola* described by Golden and

Scanned with CamScanner

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

USE OF DIFFERENT DOSES OF SYSTEMIC FUNGICIDE (PROPICONAZOL) FOR MANAGEMENT OF FOLIAR BLIGHT DISEASES OF BARLEY

SANTOSH KUMAR, S.P.SINGH, SUBHASH CHANDRA, ASHOK KUMAR AND RAMESH CHAND*
Department of Plant Pathology, Department of Nematology*, Narendra Deva University of Agriculture & Technology Kumarganj, Ayodhya, U.P. 224229.

Abstract

Barley crop suffers from a number of fungal foliar diseases which cause heavy yield loss. Investigations were therefore, conducted to record the disease severity and avoidable yield loss caused by different foliar blight pathogens and fungicidal management against these diseases. Field trial conducted and established 2 sprays of propiconazole (Tilt 25 EC) @ 1.0, 0.75 and 0.50 l/ha each at boot leaf and soft dough stages as most effective for managing foliar blight of highly susceptible barley variety RD 2503. It resulted in 40.55, 48.77 and 59.30 per cent disease severity, 37.13, 36.96 and 32.75q/ha yield and 33.32, 33.03 and 24.42 per cent avoidable yield loss. It was significantly followed by treatments having single spray of propiconazole @ 1.0, 0.75 and 0.50 l/ha at boot leaf stage with disease intensity 56.94, 63.60, 69.99 per cent, yield 34.56, 32.43, 26.13 q/ha and 28.38, 23.70, 0.282 per cent avoidable yield loss.

Keywords: Foliar blight, fungicidal management, propiconazole

Introduction

Barley (*Hordeum vulgare* L.) is one of the important crops of present era due to its superior nutritional qualities and satisfactory yield in problematic soil. It is grown under a wide range of environmental conditions, cooler climates, during the growing seasons, and well drained light to heavy loam soil being most suitable. Barley is a crop of international importance and serve mainly as staple food, feed to livestock and poultry, as malt for manufacture of bear and other liquors like whisky, brandy etc. Foliar blight causing pathogens viz., *Bipolaris sorokiniana*, *Alternaria alternata*, *Drechslera graminea* and *Drechslera teres* are most destructive pathogens of barley and cause severe yield loss. The management of foliar blight pathogens is more effective by using different doses of propiconazole (Tilt 25 EC) sprayed at different crop growth stages. The chemical control of these pathogens therefore, is alternative possibility. Propiconazole as a effective chemical against foliar blight diseases after six to some years.

Materials and Methods

The experiment having following details, were conducted with view to work out an effective fungicidal management schedule for the disease. Two sprays of propiconazole (Tilt 25 EC) @ 1.0 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @ 1.0 l/ha, at boot leaf stage. Two sprays of propiconazole (Tilt 25 EC) @ 0.75 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @0.75 l/ha, at boot leaf stage. Two spray of propiconazole (Tilt 25 EC) @ 0.50 l/ha, each at boot leaf and soft dough stages. One spray of propiconazole (Tilt 25 EC) @ 0.50 l/ha, at boot leaf stage. Two spray of water @ 1000 l/ha, each at boot leaf and soft dough stages and untreated (check). Initiation of the disease, disease intensity after 15 and 30 days spray of Tilt following Kumar *et al.*, 1998, double digit scale, 1000-grain weight (test weight) and yield (q/ha).

Comparison between all the 8 treatments was made based on means of relevant parameters. Severity recorded on double digit scale, rating was averaged for leaf and next lower leaf as per (Dubin *et al.*, 1998) formula, which served as means of observation. Avoidable yield losses will be calculated by the formula given below:

$$AYL = \frac{YP - YU}{YP} \times 100$$

Where,
YP = Yield under protected condition
YU = Yield under unprotected condition

Per cent disease intensity (PDI) was calculated by employing the formula:

$$PDI = \frac{\text{Sum of total numerical rating}}{\text{Total number of leaves examined} \times \text{highest rating}} \times 100$$

Results and Discussion

Foliar blight of barley caused by *Bipolaris sorokiniana*, *Alternaria alternata*, *Drechslera graminea* & *Drechslera teres* was managed by using different doses of propiconazole (Tilt 25 EC) sprayed at different crop growth stages. Disease severity, thousand grain weight, yield quintal per hectare and avoidable yield loss was recorded in each treatment separately. All the treatments except water spray were found significantly effective in reducing the disease severity over untreated check. The propiconazole, with disease intensity of 40.55 per cent proved most effective when sprayed @ 1.0 l/ha, both at boot leaf and soft dough stages. Similar sprays @ 0.75 l/ha with a disease intensity of 48.77 per cent were next to follow. It was significantly followed by treatments having single spray of propiconazole @ 1.0 l/ha, at boot leaf stage and two sprays of 0.50 l/ha, each at boot leaf and soft dough stages (Table 1).

The treatments have their significant impact on the yield of barley grains over untreated check and water spray. The treatment, two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages, with 37.12 q/ha grain yield gave significantly higher yields over rest of the treatments followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages with 36.12 q/ha grain yield, but both were at par. These were followed by single spray of propiconazole @ 1.0 l/ha, at boot leaf stage, two sprays @ 0.50 l/ha, each at boot leaf and soft dough stages, and single spray @ 0.75 l/ha at boot leaf stage with grain yield of 34.56, 32.75 and 32.43 q/ha respectively. Single spray @ 0.50 l/ha at boot leaf stage with a yield of 26.13 q/ha were recorded least effective amongst all the treatments and also at par with untreated check and water sprayed.

Data gathered on account of test weight of barley grains. Approximately similar results were also recorded in case of test weight. Two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages gave significantly best performance (40.52 g) over all the treatments and untreated check followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages but both were at par. Single spray of propiconazole @ 1.0 l/ha, at boot leaf stage, single spray @ 0.75 l/ha and two sprays of propiconazole @ 0.50 l/ha, each at boot leaf and soft dough stage were the second performer which gave 37.91 g, 37.10 and 37.46 g test weight respectively and all were statistically at par. All the treatments of propiconazole were significantly superior over untreated check and water sprays. Maximum loss of 33.32 per cent in grain could be avoided with two sprays of propiconazole @ 1.0 l/ha, each at boot leaf and soft dough stages, followed by two sprays of propiconazole @ 0.75 l/ha, each at boot leaf and soft dough stages which avoided a loss of 33.03 per cent in grains. Minimum avoidance of loss of grains (0.28 per cent) was recorded with single spray of propiconazole @ 0.50 l/ha, at boot leaf stage. All the treatments propiconazole found significantly effective in reducing the disease severity. Propiconazole at concentration of 1.0 l/ha sprayed at boot leaf and soft dough stages, proved significantly superior in managing leaf blight intensity over check and all other treatments. The propiconazole, with disease intensity of 40.55 per cent proved most effective when sprayed @ 1.0 l/ha, both at boot leaf and soft dough stages. Similar sprays @ 0.75 l/ha with disease intensity of 48.77 per cent were next to follow. It was

Scanned with CamScanner

Research Article

Ann. Pl. Protec. Sci. 27 (1) : 122-125 (March, 2019)

doi: 10.5958/0974-0163.2019.00024.7

Effect of Neem plant parts and its products on egg hatching and larval penetration of *Meloidogyne incognita* on Tomato

Shyam Babu Gautam, Ramesh Chand, Vipin Kumar Verma, Manish Kumar and Ram Veer

Department of Nematology, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229 (U.P.)
<kardam.nda@rediffmail.com>

Date of Receipt: 20.02.2019; Accepted: 07.03.2019

ABSTRACT

The data showed the significant reduction in egg hatching and larval penetration in all the cases with increase in exposure period. The observation indicated highest reduction in hatching (220.25) in neem ethanol leaf extract @ 5.0% treatment followed by leaf extract @ 5.0%, 2.0%, achook @ 7.5%, 5.0%, leaf compost @ 7.5%, 5.0% and neem cake @ 7.5%, 5.0% i.e. 233.00, 236.50, 268.25, 275.25, 291.75, 436.50, 441.75, 445.50 and 454.50, respectively in descending order over control at 12 hrs exposure period. After 24 hrs of incubation period the hatching was observed 270.00, 233.00, 236.50, 268.25, 275.25, 291.75, 436.50, 441.75, 445.50 and 454.50 after 48 hrs of incubation period was hatching was observed 330.50, 349.25, 351.25, 378.00, 385.00, 396.25, 315.75, 328.00, 336.00 and 347.50 after 72 hrs of incubation period was hatching was observed 391.75, 397.50, 406.00, 419.75, 424.75, 431.50, 280.25, 294.25, 301.25 and 312.75 in ethanol leaf extract @ 5.0%, 2.0%, leaf extract @ 5.0%, 2.0%, achook @ 7.5%, 5.0%, leaf compost @ 7.5%, 5.0%, neem cake @ 7.5% and 5.0% treatment, respectively. At all the four incubation period i.e.12, 24, 48 and 72 hrs the hatching inhibiting was of greater instarce which recorded as the period was increased. Similar trends were also observed larval penetration in all the treatments at all exposure periods.

Key words: *Azadiracta indica*, Hatching, Penetration, *Solanum lycopersicum*.

Tomato (*Solanum lycopersicum* Mill.) is an important food and cash crop of the formers and is widely cultivated throughout the country. Root-knot nematodes (*Meloidogyne* spp.) are among the major pathogens of vegetables especially in tomato and eggplant throughout the world. It severely restrict all the vital functions of plant roots including the absorption and transportation of water and nutrient. Besides, they provide easy entrance to micro-organism which creates secondary infection in root system (Romy & Robert, 2008). Therefore, to avoid damage due to root-knot nematode, appropriate management options should be applied timely. Thus, the present study was planned to test the efficacy on neem biopesticides on hatching and penetration to tomato.

Materials and Methods

Experiment was conducted under natural pot condition at experimental field of Department of Nematology, NDUAT, Faizabad. The effect of neem plant products *viz*. neem cake, Achook, leaf compost, Leaf extract (ethanol), leaf extract (water), on egg hatching of *Meloidogyne incognita* was studies. A total eleven treatments i.e. Ethanol leaf extract @ 5.0% (T_1), ethanol leaf extract @ 2.0% (T_2), leaf extract @ 5.0% (T_3), leaf extract @ 2.0% (T_4), leaf compost @ 7.5% (T_5), leaf

Scanned with CamScanner

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(2): 1287-1290
© 2019 JEZS
Received: 13-01-2019
Accepted: 17-02-2019

Manish Kumar
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ramesh Chand
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Kumar Verma
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Shyam Babu Gautam
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Himanshu Verma
Department of Agronomy, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Manish Kumar
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Survey on alternate weed host of rice root-knot nematode, *Meloidogyne graminicola* in kharif Session

Manish Kumar, Ramesh Chand, Vipin Kumar Verma, Shyam Babu Gautam and Himanshu Verma

Abstract
The survey conducted to know the alternate weed host of rice root-knot nematode showed that out of 465 sample collected from both rice and wheat field of metrology farm, GPB field and the Jorium 50 samples collected from rice crop and 80 sample wheat field were found free from any nematode sample while 210 and 79 samples was observed to be infected with the larvae and galls were recorded ransing from 3-19 on the root of rice plant and 1-3 gallls per plant on wheat the decomposed plant leaves of wheat botanicals was used @5, 10 and 15g/kg soil in nematode infecting soil containing 3 larvae/ g soil.

Keywords: Rice, wheat, survey, *Meliodogyne graminicola*

Introduction
Rice (*Oryza sativa* L.) is the staple food of a vast majority of the population in the East and South East Asian, African and South American countries. In addition to its direct food value, rice grain is used in manufacturing of several industrial and commercial products. The paddy is most important cereal crop in India occupying 44.48 million hectares of area with an annual production of 112.91 million tones with the productivity of 19.56 quintals per hectare during 2017-18. Rice is grown in diverse environment either as a sole crop (rainfed, irrigated or deepwater) or as major component in various cropping systems. Cropping systems, involving different year specific crop sequences or fallow in a given area, create conditions of varying favorability for microbes and weeds and thus affect the flora and fauna. Since, rice cultivation cover large area in India, even a smallest pest problem would have great impact on yield and farmers' income. Soil borne diseases are becoming increasingly important in the rice-based cropping systems. One of the most important soil born pests is plant parasitic nematode in rice crop. About 300 nematode species belonging to 35 genera have been reported infesting rice. Among them, *Meloidogyne graminicola* (Golden and Birchfield) is considered as most important constraint in rice production. *Meloidogyne graminicola* reduce rice yield by more than 17% in a greenhouse experiment and the yield losses might go as high as 98% (Bridge & Plowright 1990) [1] in pot experiment under favorable conditions. To prevent further yield losses and improve productivity, it is necessary to find out the effective sustainable management strategy. Many species of *Meloidogyne* have been reported by various scientists throughout world. *M. graminicola* is reported as an important nematode pest of rice from countries like South East Asia, Burma, Bangladesh, Laos, Thailand, Vietnam, India, China, Philippines, Nepal and USA. *Meloidogyne oryzae* an another species of this genus is also reported on irrigated rice from Surinam and *M. incognita* is reported from Costa Rica, Cuba, Egypt, Ivory Coast, Nigeria, South Africa and Japan, *M. javanica* in Brazil, Egypt, Comoro Islands, Nigeria and Ivory Coast. Apart from this *M. arenaria is reported from* Nigeria, Egypt and South Africa and *M. salasi* in Costa Rica and Panama on upland rice.
Considering the fact that *M. graminicola* is serious nematode pest of rice of eastern Uttar Pradesh where it is predominantly used by the farmers, investigation was planned to generate information on its distribution and host range with host reaction on some rice and wheat varieties. Broad host range of nematode is beneficial to maintain population in absence of main host, many scientist have reported that rice root knot nematode *M graminicola* maintain the population on various weed host and maintain population on weeds for next season (Rich, *et al.*, 2009) [3]. Moreover rice root nematode complete life cycle is a very fast span, within 15 days at 27-37 °C (Jaiswal and singh, 2010) [7].

Scanned with CamScanner

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(1): 1308-1311
© 2019 IJCS
Received: 15-11-2018
Accepted: 19-12-2018

Vipin Kumar Verma
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ramesh Chand
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Shyam Babu Gautam
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Manish Kumar
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Richa Singh
Department of Plant Pathology, V.B.S. Purvanchal University, Jaunpur, Uttar Pradesh, India

Correspondence
Vipin Kumar Verma
Department of Nematology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Effect of *Parthenium hysterophorus* plant parts products on hatching and larval penetration of root-knot nematode, *Meloidogyne incognita*

Vipin Kumar Verma, Ramesh Chand, Shyam Babu Gautam, Manish Kumar and Richa Singh

Abstract
An experiment was conducted on the effect of *Parthenium hysterophorus* on hatching of *Meloidogyne incognita* eggs under pot condition during 2017-18. The observations reveal that all the treatment were found significantly different from each other over control except to that of leaf compost @ 2.0 % with leaf powder @ 2.0 %; leaf compost @ 5.0 % with leaf powder @ 5.0 % and 7.5 %; ethanol leaf extract @ 2.0 % with 5.0 % with leaf extract 5.0 % were found at par to each other. The egg hatching recorded highest (609.75, 692.25, 702.00 and 725.50) was observed at 12, 24, 48 and 72 hours in control treatment where soil is not amended, however the minimum hatching was seen ethanol leaf extract treatment followed by leaf powder, leaf compost, leaf extract and ethanol leaf extract. The impact of *Parthenium hysterophorus* on larval penetration of *Meloidogyne incognita* shows that the penetration of second stage juvenile in the root system decreased in all the treatments as compared to untreated check. Maximum penetration was observed in untreated check i.e. 510.50, 565.25, 614.00, 692.75 and minimum penetration observed in the treatment in ethanol leaf extract @ 5% i.e. 204.00, 245.75, 325.25, 346.50 after incubation period 12, 24, 48 and 72 hours respectively.

Keywords: Tomato, *Parthenium hysterophorus*, *Meloidogyne incognita*, egg hatching and larval penetration

Introduction
Tomato (*Lycopersicon esculentum* Mill.) is an important cash crop grown by both sustainable and commercial growers in India. It is grown in both rainy and dry season. It is perhaps the most profitable crop for small- scale farmers. Genus *Lycopersicon* has several species, but only two of them are edible i.e. L. *esculentum* Mill. and L. *pimpinenellifolium* Muller, are the only cultivated tomato. The tomato is an important vegetable crop which is cultivated throughout the year. In India, tomato is cultivated in 8.09 lack ha. With a total production of 19.69 corer tonnes with the productivity of 24.40 tonnes/ha. (NHB, 2016-17) [10]. The total area under tomato cultivation in Utter Pradesh is 2.08 lakh ha. With total production of 82.63 lakh tonnes and the productivity is 39.57 tonnes/ha. (NHB 2016-17) [10]. The ability of this crop to grow throughout the year, except in extreme climatic condition, makes it a very valuable to the growers and is an additional source of earning profit even during off season and tomatoes are being cultivated as food (Boswell, 1949) [3]. It can be used as a vegetable, soup, salad, pickles, ketchup, sauce and in many other ways. It is the most important "Protective food" because of it special nutritive value and also of its widespread production. Tomato is an important component in the diets of majority of Indians. The tomato fruit has been found to have considerable health benefits.

In spite of development of various plant protection measures, the crop unfortunately suffers severely from several diseases caused by bacteria, fungi, virus, nematode or by adverse environmental condition. Among nematodes, root-knot nematode, *Meliodogyne incognita* (Alam *et al*, 1975) [1], *M. javanica* (Rao and Prasad, 1969) [8], attack tomato crop but the root-knot nematode is the most common. Due to the wide distribution of root-knot nematode, it has gained countries. However, in Rajasthan, in was first noticed by Arya, 1957 [2] and found its infestation on tomato and later Yadav and Naik, 1966 [13], found *Meliodogyne spp*. Widely distributed in the soils of Udaipur, infecting vegetable and many other economically important crops.

Scanned with CamScanner

VOL. VIII, ISSUE SPECIAL(E) , AUGUST 2018 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

RESPONSE OF PHOSPHOGYPSUM TO VARIOUS CULTIVARS OF FODDER OAT *(Avena sativa* L.*)* IN SODIC SOILS

P. Pal, Suresh Kumar*, S. F. A. Zaidi, R. S. Yadav, Subhash Chandra Ram Bharose and Ramesh Chand
Department of Soil Science and Agricultural Chemistry
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U. P.)
224 229

Abstract

Oat is one of the most important cereal fodder crops of Rabi season. It provides soft and palatable fodder. Its fodder, on dry matter basis contains 10.0 -11.5 % crude protein, 55-63 % neutral detergent fiber, 30-32 % acid detergent fiber, 22.0-23.5 % cellulose and 17-20 % hemicelluloses when harvested at 50 % flowering stage of crop. Oat is also used as straw, hay or silage. Total world area under oats is approximately 13.9 million hectares. The production of oat is not being fully exploited because of the lack of proper information on its optimum fertilizer requirement. Among the different production factors, fertilizer application is one of the most important factors in limiting the production of oat crop.

Introduction

Phosphogypsum is a byproduct of all diammonium phosphate plants. Every matric tons (MT) of phosphoric acid manufactured generates 5 MT of phosphogypsum. There is now an estimated stock of about 125 lakh MT of byproduct phosphogypsum in the country. Its agricultural use started only very recently with the onset of calcium and sulphur deficiency in oat grown mostly in light textured soil. Its utilization is however very much restricted because of lack of knowledge on its use, appreciation of benefit in different crops and anticipated environmental problem associated with its use. Phosphogypsum contains 16% S, 22% Ca and 0.71% P_2O_5. Pure gypsum ($CaSO_4$) contains 18.6% S and 21% Ca, while commercial agricultural grade gypsum of 70-80% purity contains 13-15% S and 40% CaO. Sulphur is now recognized as the fourth major plant nutrient after nitrogen, phosphorus and potassium. Crops in general require as much sulphur as they need phosphorus. Sulphur deficiencies have been reported in soil from several state of India and importance of sulphur fertilization in increasing crop yield and product quality is being increasingly recognized. It performs many important functions in the plants. It is best known for its role on the synthesis of protein and vitamins. It is constituent of amino acids and thus vital for production. Sulphur is associated with the production of crop of superior nutritional quality. Since the quality of forage crop is important for their utilization by live stock, hence sulphur fertilizer is of much important in forage production. It enhances the effects of other nutrients also. The effect of sulphur on yield and crop quality is further enhanced where it interacts positively with other nutrients. Reports on the sulphur phosphorus interaction have been conflicting since both positive and negative interactions have been observed (Kanwar and Mudahar, 1985). The sulphur application can ensure the high production of oat. Keeping facts in view an effort has been made to assess the phosphogypsum level which is a byproduct of phosphoric acid plant and on various cultivar of Oat fodder crop.

Material and Methods

The field experiment was conducted to evaluate the effect of phosphogypsum levels to various cultivar of fodder oat crop at Genetics and Plant Breeding Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India during *Rabi* season 2015-2016 under the project of All India Coordinated Research Project (AICRP) on forage crops. The experimental soil having silty loam in texture, pH (1:2.5) 8.59, EC 0.38 dSm^{-1}, Organic carbon 3.1 gkg^{-1}, available nitrogen 173.4, phosphorus 14.80 and potassium 195.10 $kgha^{-1}$. The twelve treatment were comprised of one time application of four levels of phosphogypsum on basis of sulphur content (0, 125, 250 and 375 $kgha^{-1}$) with three cultivar viz. NDO-1, NDO-2 and NDO-711 in randomized block design replication each treatment thrice. The plant spacing was row to row 25cm and plant to plant 5cm. The phosphogypsum was applied through broadcast and surface incorporation. The half dose of nitrogen @ 100 kg N ha^{-1} though urea, and full dose phosphorus @ 40 kg P_2O_5 ha^{-1} through Diammonium phosphate applied at the time of sowing of the crop. The remaining half dose of nitrogen was top dressed in standing crop at 25 DAS just after first irrigation of the crop. Representative soil samples at initial and after harvest of the crop (0-15cm) of investigation were drawn from individual treatment plot and analyzed with methods described in *Jackson*, 1973. The cutting was done with the help of sickle at 50% flowering stage at 105 DAS. The chlorophyll contents was estimated following the methods of Arnon and Stout (1949) and expressed as mgg^{-1} fresh leaves. The nutrient uptake was calculated with multiplication of dry matter yield by nutrient content in percentage.

Results and Discussion

Growth and fodder yield

Data pertaining to growth and fodder yield are presented in Table-1. Inherent genetic variability in plant was notice among entries. Among the entries of fodder oat crop, the maximum plant height with NDO-711(113.5cm), tillers m^{-2} (397), dry matter accumulation (1273.27 gm^{-2}), green forage yield (515.28 qha^{-1}), dry matter yield (124.33 qha^{-1}), crude protein yield (13.83 qha^{-1}) and chlorophyll content (1.70 mgg^{-1}) which was found significantly superior in respect of plant height, dry matter accumulation, green forage yield, dry matter yield, crude protein yield and chlorophyll content over rest of the cultivars. Among the phosphogypsum levels the maximum plant height (117.9 cm), tillers (391 m^{-2}), dry matter accumulation (1241.78 gm^{-2}), green forage yield (515.2 qha^{-1}), dry matter yield (124.2 qha^{-1}), crude protein yield (14.2 qha^{-1}) and chlorophyll content (1.78 mgg^{-1}) were received with the application of phosphogypsum 375 $kgha^{-1}$ (60kg S ha^{-1}) which was found significantly superior in respect of plant height, dry matter accumulation, green forage yield, dry matter yield, crude protein yield and chlorophyll content with 125 $kgha^{-1}$ and found statistically at par the level of 250 kg ha^{-1} phosphogypsum. Better growth and development of oat plants due to higher levels of phosphogypsum (sulphur) doses would have been due to multiple role of S in protein and carbohydrate metabolism of plants by activating a number of enzymes which participate in dark reaction of photosynthesis hence increases the plant height and dry matter was observed with increased doses of phosphogypsum (sulphur). Similar finding were also reported by Choudhary *et al.* (2013), Varshney *et al.* (2008) and Tanveer *et al.* (2013) Sulphur play an important role in plant metabolism by virtue of being essential constituent of various metabolically active compounds like amino acid, proteins, nucleic acid, porphyrins (chlorophyll), enzyme and co-enzyme. Constituent of chlorophyll it is important for photosynthesis. It influences the rate of cell division and their enlargement and hence tends to rapid growth of meristemetic tissue. Similar finding were also reported by Shukla and Menhi (2004).

Nutrient uptake

The data with respect to nutrient uptake by oat fodder presented in Table-2 which revealed that among the entries of fodder oat crop, the maximum nutrients uptake (N 22.78, P 25.98, K 213.37 and S 22.60 kg ha^{-1}) were received with the cultivar NDO-711 which was significantly superior over rest of the entries (NDO-2 and NDO-1). This might be due to the genetic characteristics of variety, resulting

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2017; 6(5): 2423-2426

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(5): 2423-2426
Received: 21-07-2017
Accepted: 22-08-2017

Ramesh Chand
Department of Nematology
N. D. University of Agriculture and Technology, Kumarganj, Faizabad, India

Pintoo Kumar
Ph.D. Scholar, Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Correspondence
Pintoo Kumar
Ph.D. Scholar, Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P, India

Studies on the bio-efficacy of *Dactylaria brochopaga* against root-knot nematode *Meloidogyne incognita* on brinjal

Ramesh Chand and Pintoo Kumar

Abstract
The *In vivo* efficacy of *Dactylaria brochopaga* against root-knot nematode, *Meloidogyne incognita* on brinjal was studied. The observations on predacity test of *D. brochopaga* against J_2 of *Meloidogyne incognita* showed that J_2 trapping increased with the increase in J_2 population and the exposure time allowed for trapping in culture being maximum at 96 hours of exposure period. while studying the effect of *D. brochopaga* in combination with various organic manures, the observations on plant height and root length showed increase in length significantly in all the treatments in comparison to the inoculated, uninoculated and treated check with minimum in inoculated check, 16.00 and 3.62 followed by treated check 18.50 and 7.50, 18.00 and 6.00 in T_3, 17.75 and 7.00 in T_1, 17.62 and 6.87 in T_2, 17.25 and 6.50 in T_4, 17.00 and 6.87 in T_5 respectively in descending order. The reproduction parameters of *Meloidogyne incognita* on brinjal i.e. Nematode population in root and soil, eggs/ plant, total nematode population and multiplication factor significant decreased in all the treatments over the inoculated check where as significant increase was observed over the treated check. The nematode population in root and soil, egg / plant, total nematode population and nematode multiplication factor was highest (121.75, 1198.00, 8642.50, 9962.25, and 6.64) in inoculated check followed by 52.25, 188.25, 3182.00, 3422.50 and 2.28 in T_5, 41.25, 182.75, 1639.50, 2163.00 and 1.44 in T_2 46.75, 162.00, 1879.00, 2087.75 and 1.39 in T_4, 48.50, 156.75, 1836.75, 2042.00 and 1.36 in T_3, 42.50, 183.25, 1774.25, 2000.00 and 1.33 in T_1 with the minimum 26.50, 122.00, 1345.50, 1494.00 and 0.99 in treated check (T_8) respectively in descending order.

Keywords: Root-knot nematode, Nematode trapping fungi, Bio-efficacy, Bio-control of nematode, Nematode management

1. Introduction
Among plant parasitic nematodes, root-knot nematode, *Meloidogyne spp.* have been identified as one of the noxious nematode problem in India as well as in world over, causing enormous yield loss in brinjal crop along with more than 2000 plant species of vegetable, fruit, spices and causing average yield loss of 5% globally. (Hussy and Janssen, 2002) [7]. The avoidable yield loss in vegetable crops due to *Meloidogyne spp.* ranges between 28.3 to 47.5 in tomato, 26.5 to 50.0 in brinjal, 19.7 to 33.3 in chilli and 60.0 to 90.0 per cent in bitter gourd under Indian condition (AICRP, 1992). Among various approaches known so far for the management of root-knot nematode, culture practices are not generally preferred because of several inherent difficulties (Jatala 1985) [9]. Although nematicidal applications manage root-knot nematode population effectively but due to high cost, non-availability, mammalian toxicity, environmental pollution and resurgence of new nematode pests, biological control of root-knot nematode through nematode trapping and antagonistic fungi is observed to be the one of the potential approaches having ability to be the environmentally safe and effective as alone and in combination as an integral part of the integrated nematode management strategy. *Arthrobotrys oligospora* having proven its nematode controlling potential (Mankar, 1962; Kerry, 1987; Cooke, 1962) [15, 5, 10]. The sophisticated larval capturing mechanism and higher nematode predacity indicate the bio-control potential of *D. brochopaga*. (Singh *et al.*, 2007) [20]. Accordingly studies on the bio-efficacy of *D. brochopaga* against root-knot nematode, *Meloidogyne incognita* on brinjal was studied.

Materials and Methods
In vitro Studies on nematode capturing ability of *Dactylaria brochopaga* was tested against J_2 of root-knot nematode, *M. incognita* using the method as described by Belder and Jansen (1994) [4]. 2.00 mm fungal disc of *D. brochopaga* was taken from the periphery of 10-12 day old culture and inoculated into the 50 mm diameter petri dishes containing 1:10 maize meal agar

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2017; 6(5): 2427-2430

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(5): 2427-2430
Received: 22-07-2017
Accepted: 23-08-2017

Pintoo Kumar
Ph.D. Scholar, Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P. India

Ramesh Chand
Department of Nematology N. D. University of Agriculture and Technology, Kumarganj, Faizabad, India

Correspondence
Pintoo Kumar
Ph.D. Scholar, Department of Nematology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, U.P. India

Studies on the bio-efficacy of *Monacrosporium eudermatum* against root-knot nematode, *Meloidogyne incognita* on brinjal

Pintoo Kumar and Ramesh Chand

Abstract
In vivo efficacy of *Monacrosporium eudermatum* against root-knot nematode, *Meloidogyne incognita* on brinjal was studied. The observations on predacity test of *M eudermatum* against J_2 of *Meloidogyne incognita* showed that J_2 trapping increased with the increase of J_2 population in culture and the exposure time allowed for trapping being maximum at 96 hours of exposure period. The observations on plant height and root length while studying the effect of *M. eudermatum* in combination with various organic manures revealed that plant height and root length increased significantly in all the treatments in comparison to the inoculated, uninoculated and treated check with minimum in inoculated check. It was observed 18.12 and 6.12 in T_1, 18.00 and 5.50 in T_2, 17.75 and 5.37 in T_3, 17.10 and 6.12 in T_4, 17.07 and 5.25 in T_5 respectively in descending order. The reproduction parameters of *Meloidogyne incognita* on brinjal i.e. Nematode population in root and soil, eggs/ plant, total nematode population and multiplication factor significant decreased in all the treatments over the inoculated check where as significant increase was observed over the treated check. The nematode population in root and soil, egg / plant, total nematode population and nematode multiplication factor was highest (121.75, 1198.00, 8642.50, 9962.25, and 6.64) in inoculated check followed by 56.75, 226.75, 3668.00, 3951.50 and 2.63 in T_5, 54.25, 207.25, 2718.75, 2980.25 and 1.99 in T3, 49.50, 219.75, 2603.25, 2872.50 and 1.91 in T_1, 50.00, 218.75, 2593.25, 2862.25 and 1.91 in T_4, 50.50, 224.00, 2487.50, 2762.00 and 1.84 in T_2 with the minimum 26.50, 122.00, 1345.50, 1494.00 and 0.99 in treated check (T_8) respectively in descending order.

Keywords: Root- knot nematode, Nematode trapping fungi, Bio-efficacy, Biocontrol of nematode, Nematode management

Introduction
Root-knot nematode, *Meloidogyne spp*. have been identified as one of the noxious nematode problem in India as well as in world over, causing enormous yield loss in brinjal crop along with more than 2000 plant species of vegetable, fruit, spices and causing average yield loss of 5 % globally. (Hussy and Janssen, 2002) [5]. The avoidable yield loss in vegetable crops due to *Meloidogyne spp*. ranges between 28.3 to 47.5 in tomato, 26.5 to 50.0 in brinjal, 19.7 to 33.3 in chilli and 60.0 to 90.0 per cent in bitter gourd under Indian condition. The approaches known so far for the management of root-knot nematode culture practices are not generally preferred due to several inherent problems (Jatala, 1985) [7]. The nematicidal applications although supress root-knot nematode population effectively but due to high cost, non availability, mammalian toxicity, environmental pollution and resurgence of new nematode pests, biological control of root-knot nematode through nematode trapping and antagonistic fungi is observed to be the one of the potential approach having ability to be the environmentally safe and effective as alone and in combination as an integral part of the integrated nematode management strategy. *Arthrobotrys oligospora* having proven its nematode controlling potential (Mankar, 1962; Kerry, 1987: Cooke, 1962) [13, 8, 3]. The sophisticated capturing mechanism and higher nematode predacity indicate the bio-control potential of *M eudermatum*. Accordingly, studies on bio-efficacy of *M. eudermatum* against root-knot nematode, *Meloidogyne incognita* on brinjal was studied.

Materials and Methods
In vitro Studies on the nematode capturing ability of *Monacrosporium eudermatum* was carried out against J_2 of root-knot nematode *M. incognita* using the method as described by Belder and Jansen (1994) [2]. 2.00 mm fungal disc of *M. eudermatum* was taken from the periphery of 10-12 day old culture and inoculated into the Petri dishes containing 1:10 maize meal agar medium (0.2% agar) in 50 mm diameter petridishes.

Scanned with CamScanner

© 2017 RELS
http://rels.comsa.com
rel_sci@yahoo.com

ISSN: 0974-4908
Res. Environ. Life Sci.
10(2) 170-172 (2017)

Evaluation of chilli (*Capsicum annuum* L.) cultivars against leaf curl virus under field condition

A.N. Chaubey and R.S.Mishra
Department of Plant Pathology, ND. University of Agril. & Technology, Faizabad-224 229. India
*e-mail: drramsumanmishra@gmail.com

(Received: April 14, 2015; Revised received: November 09, 2016; Accepted: November 16, 2016)

Abstract: Chilli (*Capsicum annuum* L.) is an economically important spice of India, which suffers many fungal and viral diseases, among them Chilli leaf curl virus is one of the most destructive pathogen causing heavy yield loss in major chilli growing area. The experiment was conducted during February to May in 2014 and 2015 to evaluate the chilli cultivars against chilli leaf curl virus. Out of 36 cultivars, none was found the immune: three cultivars viz Sanjmukhi, Japani long and Pusa Jwala was showed highly resistant, where as ten cultivars viz., Agni,Arkalohit, Faizabad kala, Super (Local), Ajeet-1 Anand, Suhawal-17, HC-44, DOH-2 and PBC-473 was showed resistant. Moderately resistant cultivars were BC 14-2, Faizabad long, PDC-54, Pant chili-1, IC 119349 and Pusa sadabhar. Rest of eight cultivars was showed moderately susceptible and nine cultivars were found highly susceptible against chilli leaf curl viral disease. These resistant and moderate resistant cultivars could be used by farmers in cultivation under integrated production systems and by breeders in developing new chilli hybrid resistant cultivars against leaf curl disease.

Key words: Chilli cultivars, Chilli leaf curl, Viral disease, Field condition

Introduction

Chilli (*Capsicum annuum* L.) is one of the most valuable crops and widely cultivated worldwide for its pungencity. Chilli is grown almost all state of India for commercial use such as vegetables, spices, and industrial (oleoresin and capsaicin extraction) purpose (Kumar and Rai 2005). India produced about 1260.1thousands metric tonn of chilli from an area of 792.1 thousands hectare, (Anonymous, 2012). Andhra Pradesh is the largest producer states of chilli in India. The crop is attacked by a large number of fungi, bacteria and viruses among of them viral diseases which are characterized by yellow mosaic, mosaic mottle, leaf curl, leaf roll and necrosis has been reported to caused heavy yield losses (Yadav et al., 2013, Talukdar et al., 2015). The occurrence of chilli leaf curl disease caused by whitefly (*Bemisia tabaci*) transmitted geminivirus of utmost concern to chilli growers for its sever incidence and complete crop failure (Kumar et al., 2009). The partial control of viruses may be achieved with the application of pesticides by the controlling the vector population but complete safer protection from the virus through host plant resistance is more preferred and effective option, leaf curl resistant genotypes under open field condition have been reported by Sharma and Singh (1985), Memane et al., (1987), and Kumar (2008). The resistance cultivars are the only way to produce disease free material, but their long term stability virtue of true resistance are need for their confirmation under field condition [illegible] and total soluble phenol are has been also infested (Ashfak et al., 2014). Present research work has been directed to identify resistance sources under field condition with continuing screening process of available genotypes against chilli leaf curl virus.

Material and Methods

The experiment was carried out during the month of February to May in 2014 and 2015 at student's instructional farms of N.D. University of Agriculture and technology, Kumarganj, Faizabad. Thirty days old seedlings were transplanted in first week of February at the spacing of 60x45 cm in augmented design under field condition for evaluation of their resistance against leaf curl virus. Total 36 chilli germplasmi cultivars were collected from Vegetable Farm, N. D. University of Agriculture and Technology, Kumarganj, Faizabad and Indian institute of vegetable research Varanasi, U.P. Seeds of all the cultivars were sown in single lines 2.0x2.5 cm deep furrow for nursery. Two rows of chilli leaf cur susceptible (check) cultivar (IC 119797) were transplanted all aroun the field to create epiphytotic conditions. Recommended package o cultural practices were followed to raise the crop and to promot natural infection. Periodical fungicidal sprays were given to avo fungal diseases. Ten plants in each plots were randomly selecte and tagged for visual observations on symptoms appearance 30, 45, 60, 75 and 90 days after transplanting. The leaf curl disea intensity noted on each cultivars and was rated following a inten scale 0 - 5 (Banerjee and Kallo, 1987). Percent Disease Inten

Scanned with CamScanner

Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.2526

ISSN: 2320 – 7051
Int. J. Pure App. Biosci. 5 (2): 690-699 (2017)

International Journal of Pure & Applied Bioscience

OPEN ACCESS

Effect of Stem Gall Disease Caused by *Protomyces macrosporus* on Biochemical Changes of Coriander

R. S. Mishra*, Sandeep Kumar, V. P. Pandey and S. P. Pathak

Department of Vegetable Science N.D. University of Agriculture and Technology, Kumarganj, UP, India

*Corresponding Author E-mail: drramsumanmishra@gmail.com

Received: 28.01.2017 | Revised: 10.02.2017 | Accepted: 11.02.2017

ABSTRACT

Aim: *Stem gall diseases have become major economic significance. The disease manifests itself in the form of galls on stem, branches, leaves, petioles and fruits, causes 15-20 per cent yield loss and deteriorates quality of seeds. Quantitative biochemical changes are required to determine for development of resistant variety against stem gall*

Methodology: *Stem gall symptoms were regularly observed during whole crop growth stage from appearance of symptom on different parts of the coriander plants. The leaves, stems, inflorescence, petioles and fruits showing characteristic symptoms were separately collected and kept in rough dry envelopes and marked clearly mentioning location, infected parts, variety reaction types, date of collection etc. and brought to the laboratory for identification of the pathogen and used for the study of biochemical changes such as total phenol, tannins, flavonoids and Saponins*

Results: *The stem gall symptoms were observed as small tumour-like swellings on all herbaceous parts of the affected plants, namely, stems, petioles, flower stalks and leaves. The mycelium of Protomyces macrosporus was septate, hyaline, irregular, branched, 2 to 5 µm thick, 36.50 µm length and 35.00 µm width. Intercellular and multinucleate mycelium's are formed Chlamydospores, which are globose to ellipsoid, thick-walled, three-layered membrane and smooth with brownish colour. Mature Chlamydospores were multinucleate and measured 60-70 µm x 50-60 µm in diameter. Severely infected plant parts have synthesized low amount of phenol, tannin, flavonoid and saponin content, whereas comparatively high amount of these compounds are found in less infected plant parts or healthy one*

Interpretation: *Stem gall infected plant parts were immediately accumulate total phenol, tannin, saponin and flavonoids following the pathogenic attack in resistant varieties, whereas susceptible varieties did not accumulate significantly higher amount of these substances.*

Key words: *Stem gall, Coriander, Symptoms, Chlamydospore, Spread, Bio-chemical*

Cite this article: Mishra, R.S., Kumar, S., Pandey, V.P. and Pathak, S.P.

Scanned with CamScanner

Plant Archives Vol. 17 No. 1, 2017 pp. 285-291 ISSN 0972-5210

ECOFRIENDLY MANAGEMENT OF LEAF CURL DISEASE OF CH THROUGH BOTANICAL BIO-PESTICIDES

A. N. Chaubey, R. S. Mishra and Virendra Singh[1]

Department of Vegetable Science, N.D. University of Agril. & Technology, Kumarganj, Faizabad-224 229 (U. P.)
[1]IFTM University, Lodhipur Rajput, Moradabad - 244 102 (U. P.), India.

Abstract

Chilli (*Capsicum annum* L.) is an important spice crop grown all over the world. The importance of chilli leaf curl, a disease has been recognized for many years, wherever chilli crop is grown. An experiment was designed to evalua efficacy of a few botanical pesticides against leaf curl viral disease in chilli. Minimum disease incidence (34.63-37.88% recorded in plots, which received seedlings treated with *Clerdendrum aculeatum* (leaf extract) followed by three foliar s of *Terminalia arjuna* (bark extract). Whereas, seedling treatment with *Clerdendrum aculeatum* (leaf extract) follow three foliar sprays of *Terminalia arjuna* (bark extract) were observed maximum per cent disease control (60.72-57.70%) with fresh fruit yield (2.35-2.07 kg plot^{-1}) and an increase in fresh fruit yield (58.75-58.24%). Maximum plant height (55.83- cm), maximum plant canopy (72.31-67.55 cm), days of 50 per cent flowering (85.04-85.79DAT), maximum fruit weight (2.23g), maximum total number of fruit plant^{-1} (72.29-70.63) and maximum number of seed fruit^{-1} (58.35-57.70).

Key words : Ecofriendly, antiviral agents, leaf curl disease, chilli.

Introduction

Chilli (*Capsicum annuum* L.) is an important spice crop cultivated in many countries throughout the world. India produces approximately 12.60 thousand metric ton from an area of 792.1 thousand hectares (Annon., 2012-13). Uttar Pradesh occupies an area of 13.47 thousand hectares with production of 10.30 metric tonns (Annon., 2012-13). India is rich in diversity of chilli varieties with different nutritional quality. Besides traditional use of chilli such as vegetables, spices, condiments, sauces and pickles; it is being used in pharmaceutics, cosmetics and beverages (Tiwari *et al*., 2005). The average productivity of chilli is very low in India comparison to other countries because the crop is infested with many insects and diseases. It is because most of chilli verities are susceptible to various pathogens; which cause heavy yield losses. Viruses are considered as one of the important limiting factor (Villalon, 1981). Among them, chilli leaf curl virus (Geminivirus) is most destructive viral pathogen in many parts of India, which is affecting chilli cultivation

human health hazards, destruction of ben microorganisms and environmental pollution. The emphasis is on the development of non-chem ecofriendly method for the management of this which has provided impetus to more extensive expl of natural resources and to identity effective extracts/botanical bio-pesticides for the managem chilli leaf curl virus by reducing vector population field.

Materials and Methods

The experiment was conducted at Stu Instructional Farm, N. D. University of Agricult Technology, Kumarganj, Faizabad. Seeds were c from the Department of Vegetable Science University of Agriculture and Technology, Kum Faizabad. The experiment was conducted duri consecutive years (2014 and 2015) consisting treatment combinations *viz* T_1- root treatme *Tinospora cordifolia*

Scanned with CamScanner

J.Pl.Dis.Sci.Vol 12(1) 2017 : 001 - 001 www.appjpds.com

IMPACT OF ORGANICS ON *COLLETOTRICHUM* LEAF SPOT DISEASE AND RHIZOME YIELD OF TURMERIC

R.S.Mishra andRamveer
Department of Vegetable Science,
N.D.University of Agril.& Technology, Kumarganj, Faizabad UP, India
*Email: drramsumanmishra@gmail.com
Mb.09450045737

Keywords: Turmeric.*Colletotrichumcapsici*, cow's urine, leaf spot, management

Turmeric (*Curcuma longa* L.)is highly prone to several fungal diseases, among them major fungal disease is leaf spot incited by *Colletotrichumcapsici* (Syd.) Butler &Bisby causing fresh rhizome yield loss to the tune of 15-60% (Pruthi, 1998) and dry rhizome yield 62% approximately. The disease was first reported from Coimbatore district by Mc Rae in 1917 (Ramakrishnan, 1954). It is more severe in southern states (Gomathi, 2001) but caused heavy yield loss in Uttar Pradesh (Mishra and Pandey, 2014).The application of chemical fungicides are producing hazardous consequences in term of soil pollution, reducing the quality of arable land and ground water (Bezbaruah, 2000) and bio-pesticides are usually inherently less toxic than conventional pesticides (Singh, 1999). They generally affect only the target pathogenic organism, in contrast to broad spectrum fungicides. Fresh plant extracts from different plant parts are becoming valuable for management of the pathogens, which can be easily prepared by farmers. Cow's urine is an important constituent of Panchgavya and is used in several Panchgavya formulations (Okigbo and Nameka,2005). Cow's urine based Nigerian herbal formulation were prepared with the use of several herbs like tobacco, garlic, lemon juice and bulbs of onion. These herbal formulations have been described for the use in medicinal and agricultural applications. (Fulzele*et al*, 2001). Keeping in view, fieldstudies were carried out to select suitable management practices for reducing the leaf

alluvial soil with having low organic matter and high pH 8.5. *Colletotrichum* Leaf Spot disease susceptible variety NDH-1 was selected for trial in Randomized Block Design with 20 treatments and three replications. Botanical-formulations were prepared with mixture of fresh neem leaves –500g, fresh madar leaves – 500g, fresh datura leaves – 500g, bulb of onion- 500g, bulb of garlic-500g. Each plant parts were grinded with the help of mixture and grinder. The grinded materials were mixed and dissolve in 5 liters of cow urine, acetone and distilled water (1:2 ratios) separately. These solutions were kept 30 days in earthen pot for fermentation. The fermented solutions were filtered through muslin cloth and use as standard solution 100 percent concentration. The rhizomes were planted on raised beds 3x1 meter size at spacing 30x25 cm in the first fortnight of July. Foliar spray @20% concentration was done at 60, 75, 90 and 120 days after planting. A sticker, ASPA 80 @ 0.1% was mixed in spray fluid for stickiness. Only water was sprayed in control for comparison. Randomly six plants of each plot were selected for recording the disease intensity at 120 days after planting. All the leaves of selected plants were individually scored based on 0-6 scale. Where 0 = No infection, 1 = 0.1 to 10 percent area infected, 2=10.1to20 percent area infected, 3 = 20.1 to 30 percent area infected, 4 = 30.1 to 40 percent area infected, 5 = 40.1 to 50 percent area infected,6 = more than 50 percent area infected. The Plant Disease Intensity (PDI) was calculated according to the formula

Scanned with CamScanner

Plant Archives Vol. 18 No. 1, 2018 pp. 126-128 ISSN 0972-5210

EFFECTS OF POLYTHENE COVERING ON STEM GALL DISEASE AND YIELD OF CORIANDER (*CORIANDRUM SATIVUM* L.)

R.S. Mishra and Ankit Tiwari*

Zonal Agricultural Research Sub-Station Baribag, Ghazipur (U.P.) India
*Department of Agronomy, N.D. University of Agriculture and Technology, Kumarganj-224229 (U.P.) India

Abstract

Coriander faces severe management issues from fungal diseases such as stem gall, wilt, blight and powdery mildew. A broad array of fungicides is used to control fungal diseases by the growers. These control agents are used injudiciously, Coriander is being of export commodity fungicides residue are very much conscious. Keeping this issues, experiment on solar heating of soil by polythene were conducted from 2014-15 to 2016-17 for the management of stem gall disease and yield of coriander. The minimum disease severity (4.6 to 21.3%) was recorded in Soil solarization + Plastic mulching+ seed treatment and foliar spray of 1% neem oil followed by Seed treatment with propiconazole (6.3-22.5%), plastic mulching + seed treatment and foliar spray of neem oil (4.9-24.2%), Soil solarization + Plastic mulching (9.0-22.8%) and Soil solarization (5.3-23.3%). The highest seed yield of coriander was also recorded in Soil solarization + Plastic mulching+ seed treatment and foliar spray of neem oil (11.17q/ha).

Key words: soil solarization, plastic mulching, stem gall, yield, coriander

Introduction

Seed spices play a significant role in our national economy because of its large domestic consumption and growing demand for export. Presently 16.53 lakh ha of area is under seed spices cultivation with production of 11.75 lakh tonnes annually (Anon, 2016). Seed spices are mainly cultivated in Rajasthan and Gujarat and have sizeable area in Madhya Pradesh, Haryana, Punjab, Uttar Pradesh, Andhra Pradesh and Karnataka. 17 seed spices are grown in the country among them coriander is pillars of economic importance because it is the highest export earner next to cumin. Coriander production was 313.6 thousand tonnes from an area of 447.1 thousand ha with 701.4 kg/ha productivity during 2013-14 (Anandaraj, 2016). In spite of several technologies were developed for the boosting of coriander production *viz.* cultivation practices, high yielding varieties for different qualities and traits, management of pest and diseases, harvesting and post harvesting processing, quality of yield production is still less in comparison to other country, it is due to lac of stem gall resistance variety and climate change whic enhanced biotic and abiotic stress. This would need hig prioritized research to convert negative effect of increas temperature into positive opportunity. Therefore, prese experiment was designed to harvest solar energy f management of stem gall disease through soil solarizati and plastic mulching.

Materials and method

The present research was carried out at Vegeta Form, N.D. University of Agriculture and Technolo Kumarganj, Faizabad, UP, India during *Rabi* 2014-15 2016-17. The seeds of coriander variety NDcar-2 w shown in field at 40cm × 10cm spacing with th replication and nine treatments *viz.* T_1= Soil solariza by polythene sheet (60 days), T_2= Plastic mulching (F sowing to harvest), T_3= Seed treatment and three fo spray at 45, 60 and 90 days with 1.0% neem oil, T_4= solarization by polythene sheet (60 days) + Pla

*Author for correspondence :

Scanned with CamScanner

J Pl.Dis.Sci.Vol 12(2) 2017 : 215 - 216

www.appjpds.org

EVALUATION OF FENUGREEK GENOTYPES FOR SEED YIELD AND DOWNY MILDEW RESISTANCE

R. S. Mishra

Department of Vegetable Science

N. D. University of Agril. & Technology, Kumarganj, -224229, Faizabad, UP, India

*Email: drramsumanmishra @ gmail.com

Key words: Fenugreek, Screening, Downy mildew, *Peronospora trigonella*, Seed yield

Fenugreek (*Trigonella foenum graecum* L.) is affected by many diseases; downy mildew caused by *Peronospora trigonella* Gaum is considered one of the most destructive and wide spread diseases of the crop, which is commonly occurring February and March (Thind, 1942, Gupta *et al.*, 2015). The infected leaves are easily detected by the presence of yellow patches on the upper surface and cottony grayish- violet mycelial growth on the lower surface of the leaves. The disease is also reported from Algeria, Pakistan, United Kingdom and India (Acharya, 2014). The common methods of disease managements are use of chemical and disease resistant variety. However continuous use of chemicals to control plant diseases is neither environmentally sound nor economically cheap (Iqbal *et al.*, 2011). The literature on downy mildew resistant germplasm of fenugreek is scanty. Therefore identification of downy mildew resistant / tolerant genotypes of the self pollinated crop will be useful for development of resistant cultivars where the disease is prevalent and causing heavy yield loss.

The field experiment was conducted at vegetable farm of N.D.University of Agriculture and Technology, Kumarganj, Faizabad and AICRP on spices centre of Jobner from 2012-13 to 2014-15. The seed materials of fenugreek genotypes were obtained from AICRP on spices IISR, Kozhikode Kerala, India. The experiment was laid out in randomized block design with three replications. Sixteen genotypes were sown in 2.0 x 2.4 m^2 area with 30 cm row to row and 10 cm plant to plant spacing. The seed was sown at 3rd week of October under natural downy mildew infected area. The percent disease intensity of downy mildew was recorded at second week of March using 0-4 scale given by earlier workers (Fallon *et al.*, 1995). The tested entries were graded 0- No disease symptoms, 1- Resistant, 2- Moderate resistant, 3- Susceptible, 4- Highly susceptible. The yield data were recorded after the harvest.

Out of 16 genotypes five were resistant, nine moderately resistant and two susceptible at both Kumarganj and Jobner test centre. None of the genotype was found immune and highly susceptible against downy mildew. However AFg-5, LFC-98, Um-202, NDM-69 and RMt-361 (Check) were found resistant with percent disease intensity of 18.99, 18.52, 19.69, 14.31 and 18.19, respectively. The genotypes JFg-245, JFg-266, AFg-6, LFC-93, Hm-280-1, NDM-72, Rm-188, Rmm-194 and Hissar Sonali were moderately resistant with ranging 24.48 to 36.97 PDI. The susceptible genotypes Hm-259 and Um-354 showed 53.20 and 42.54 percent disease intensity at Kumarganj. Whereas, at Jobner, AFg-5, Um-202, NDM-69, Rm-188 and RMt-361 showed resistant reaction with 15.83, 6.66, 16.66, 10.83 and 13.33 percent disease intensity, respectively. The genotypes JFg-266 (23.33PDI), AFg-6 (39.19 PDI), LFC-98 (35.0PDI), Hm-280-1(38.33PDI), Um-354 (36.99PDI), NDM-72(28.33 PDI) and Hissar Sonali(28.33PDI) were categorized moderately resistant, while rest of the genotypes were susceptible to downy mildew at Jobner. The findings are supported with earlier workers (Thind, 1942; Prakash and Saharan, 2001; Gupta *et al.*, 2015). Yield data of 16 genotypes (Table-1) revealed that highest grain yield was recorded in JFg-245 (1402Kg/ha) and lowest in Hissar sonali (1231Kg/ha) at Kumarganj. Rm-188 (1489.35Kg/ha), NDM-69 (2276.39Kg/ha) and Um-202 (2186.73 Kg/ha) produces highest seed yield at Jobner. Average yield of fenugreek was reported from 150-2800 Kg/ha by growers under dry land conditions and

Received on: 05-04-2017

Accepted on: 09.05.2017

Scanned with CamScanner

J.Ph.Dis.No.Vol.12(1) 2017 : 001 : 001 www.apppb.com

IMPACT OF ORGANICS ON *COLLETOTRICHUM* LEAF SPOT DISEASE AND RHIZOME YIELD OF TURMERIC

R.S.Mishra andRamveer
Department of Vegetable Science,
N.D.University of Agril & Technology, Kumarganj, Faizabad UP, India
*Email: drramsumanmishra@gmail.com
Mb 09450045737

Keywords: Turmeric *Colletotrichumcapsici*, cow's urine, leaf spot, management

Turmeric (*Curcuma longa* L.)is highly prone to several fungal diseases, among them major fungal disease is leaf spot incited by *Colletotrichumcapsici* (Syd.) Butler &Bisby causing fresh rhizome yield loss to the tune of 15-60% (Pruthi, 1998) and dry rhizome yield 62% approximately. The disease was first reported from Coimbatore district by Mc Rae in 1917 (Ramakrishnan, 1954). It is more severe in southern states (Gomathi, 2001) but caused heavy yield loss in Uttar Pradesh (Mishra and Pandey, 2014).The application of chemical fungicides are producing hazardous consequences in term of soil pollution, reducing the quality of arable land and ground water (Bezbaruah, 2000) and bio-pesticides are usually inherently less toxic than conventional pesticides (Singh, 1999). They generally affect only the target pathogenic organism, in contrast to broad spectrum fungicides. Fresh plant extracts from different plant parts are becoming valuable for management of the pathogens, which can be easily prepared by farmers. Cow's urine is an important constituent of Panchgavya and is used in several Panchgavya formulations (Okigbo and Nameka,2005). Cow's urine based Nigerian herbal formulation were prepared with the use of several herbs like tobacco, garlic, lemon juice and bulbs of onion. These herbal formulations have been described for the use in medicinal and agricultural applications. (Fulzele*et al*, 2001). Keeping in

alluvial soil with having low organic matter and high pH 8.5. *Colletotrichum* Leaf Spot disease susceptible variety NDH-1 was selected for trial in Randomized Block Design with 20 treatments and three replications. Botanical-formulations were prepared with mixture of fresh neem leaves –500g, fresh madar leaves – 500g, fresh datura leaves 500g, bulb of onion- 500g, bulb of garlic 500g. Each plant parts were grinded with the help of mixture and grinder. The grinded materials were mixed and dissolve in 5 lite of cow urine, acetone and distilled water (1 ratios) separately. These solutions were k 30 days in earthen pot for fermentation. T fermented solutions were filtered throu muslin cloth and use as standard solution percent concentration. The rhizomes w planted on raised beds 3x1 meter siz spacing 30x25 cm in the first fortnight of Foliar spray @20% concentration was do 60, 75, 90 and 120 days after plantin sticker, ASPA 80 @ 0.1% was mixed in fluid for stickiness. Only water was spray control for comparison. Randomly six of each plot were selected for recordin disease intensity at 120 days after pla All the leaves of selected plants individually scored based on 0-6 scale. 0 = No infection,1 = 0.1 to 10 percen infected, 2=10.1to20 percent area infe = 20.1 to 30 percent area infected, 4 = 40 percent area infected, 5 = 40.1 to 50 area infected,6 = more than 50 perc

Scanned with CamScanner

Contents lists available at www.innovativejournal.in

ACADEMY OF AGRICULTURE JOURNAL

Available online at http://innovativejournal.in/aaj/index.php/aaj

Effect of organic treatment on stem gall disease, growth and yield of coriander

R.S.Mishra and V.P.Pandey

Department of Vegetable Science N.D. University of Agriculture and Technology, Kumarganj,-224229, UP, India

ARTICLE INFO

Corresponding Author:

R.S.Mishra

Department of Vegetable Science N.D. University of Agriculture and Technology, Kumarganj,-224229, UP, India

Email:drramsumanmishra@gmail.com

Keywords: Coriander, stem gall, Panchgavya, cow urine, cow dung

ABSTRACT

Coriander (*Coriandrum sativum* L.) is an important spices crop, grown in a wide range of weather conditions. Coriander suffers from various abiotic and biotic diseases. Among the biotic diseases, stem gall caused by *Protomyces macrosporus* is a major disease, which causes yield loss up to 33-36%. The experiments were conducted during 2016-17 at Vegetable Farm, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) with eleven treatments *viz*., cow urine, cow dung slurry @ 10, 20 and 30% concentration of panchgavya, thiram @ 0.25%, carbendazim @ 2%, propiconazole @ 0.2% concentration and control. The effectiveness of organic treatments @ 30% concentration was significantly reducing the disease intensity. The maximum reduction was found 49.60% and 49.57% in panchgavya @ 30% concentration and minimum 17.61%, 26.88% in cow dung slurry @ 10% concentration during flowering and maturity stage respectively. In case of fungicides, the maximum disease control was recorded 51.70% at flowering stage and 49.71% at maturity stage treated with propiconazole @ 0.2% concentration. The maximum average numbers of chlamydospores were found at soil surface (198.80 g soil^{-1}) and minimum in 2 inch depth (42.20 g soil^{-1}) around the plant. The highest plant height (111.14 cm), no. of branch's/plant (7.26), number of umbel/plant (100.6), nuber of umblet/plant (6.13), seed weight/plant (9.82 g), straw weight (14.52 g) were obtained in seed treatment + soil drenching of panchgavya @ 30% concentration. The lowest plant height (101.13 cm), no. of branch's/plant (6.60), number of umbel/plant (84.93), number of umblet/plant (5.33), seed weight/plant (7.78 g) and straw weight (9.58 g) were obtained in seed treatment + soil drenching with cow dung slurry @ 10% concentration respectively.

©2017, AAJ, All Right Reserved

Scanned with CamScanner

Volume 2 Issue 3 March 2018

Review Article

Chilli Leaf Curl Virus and its Management

RS Mishra* and AN Chauvey

Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

*Corresponding Author: RS Mishra, Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India.

Received: December 20, 2017; **Published:** February 07, 2018

Abstract

Chilli (*Capsicum annuum L.*) is an economically important and widely cultivated crop of India. Chilli leaf curl virus is one of the major limiting factors in chilli production, which is drastically decreases yield. The significant symptoms of chilli leaf curl are curling of leaf margin, reduction in leaf size, vein clearing accompanied by puckering, thickening and swelling of the veins. The maximum leaf curl disease was observed in 19th standard week when the white fly population was highest in the field. The increase or decrease of leaf curl virus disease of chilli was found directly correlated with vector population and vector population was determined by environmental factors. Three cultivars of chilli viz., Surajmukhi, Japani long and Pusa Jwala were showed highly resistant against leaf curl disease. Seed treatment with raw cow milk and *Trichoderma viridae* showed the reducing trends of chilli leaf curl disease incidence. Whereas seed treatment with imidacloprid 70 WS (5 gm/kg) along with two sprays of imidacloprid 17.8 SL (0.24 ml/lit) at 45 and 60 days after planting recorded least number of whiteflies and leaf curl virus per plant with significant increase of growth and yield.

Keywords: Chilli Leaf Curl; *Capsicum annuum L.*

Introduction

Chilli leaf curl locally known as murda is a most destructive disease of chilli in India. It is transmitted by mites (*Polyphagotarsonemus latus* Banks) (Kulkarni, 1924) and thrips (*Scirtothrips dorsalis* Hood). The natural occurrence of tobacco leaf curl virus was observed on chilli in India by Pal and Tandon (1937) and Seth and Dhanraj (1972). Chilli is known to be affected by forty two viruses, twenty two of them reported to occur naturally and twenty viruses infect to chilli through artificial inoculation. Among the twenty two viruses occur naturally on chilli, eleven viruses have been reported from India, viz., cucumber mosaic virus [1], tobacco leaf curl virus [2], Indian chilli mosaic virus [3] potato virus Y [4-6] and Potato virus X [7,8]. Prasada Rao [9] reported tobacco ring spot virus, pepper veinal mottle virus and pepper vein banding virus, Chilli leaf curl virus [10] and Tomato leaf curl New Delhi virus [11,12].

Importance of chilli leaf curl complex disease

Sastry and Singh [13] reported that TLCV infected plants produced very few fruits when infected within 20 days after planting and resulting up to 92.3 per cent yield loss. Plants infected 35 and 50 days after transplanting resulted in 74 and 22.9 per cent yield loss, respectively. The premature death of seedlings was observed when infection was occurred at 2nd and 4th leaf stages, while a considerable reduction in plant height (70.9 cm) and internodal length (5.7 cm) was observed in comparison to healthy plants (127.0 cm and 12.2 cm). The yield reduction at 5th leaf stage was found 94.9 per cent, while it was 65.8 per cent at 10 - 11th leaf stage infection.

Symptomology

Leaf crinkle or leaf curl complex was observed on chillies by Hussain [2]. The vein clearing and leaf malformation was reported by Fernando and Pieries (1967). Curling of leaf margin, reduction in leaf size, vein clearing were observed in India, Sri Lanka and USA [14]. Abaxial curling of the leaves accompanied by puckering, thickening and swelling of the veins were observed by Mishra., *et al.* [15] and Muniyappa and Veeresh [16]. Appearance of most prominent symptoms such as vein clearing followed by veinal distortion, swelling of veins and vein lets on dorsal side were reported by Muniyappa [17] and Ravi [18].

Survey of chilli leaf curl viral complex on chilli in some districts of Uttar Pradesh

Some perennial types with small pungent fruits in Tarai region of Uttar Pradesh were shown to immune against viruses. Selection from crosses between the perennial local types and NP - 46 A was released under the name Pant C - 1, and Pant - 2, which were known to be resistant for leaf curl virus [19]. Wet and dry season are favourable for infection of chilli leaf curl virus on chilli (*Capsicum frutescens* and *C. annuum*), mung bean yellow mosaic virus on mung bean (*Vigna radiata*) and okra yellow vein mosaic virus on okra, all were transmitted by *Bemisia tabaci* (Gennadius) Shivanathan., *et al* (1983). Leaf curl disease of chilli was emerged as a serious problem in Jodhpur district, the major chilli growing area of Rajasthan state. During december, very high disease incidence up to 100% observed in farmer's fields in Narwa and Tinwari villages

Scanned with CamScanner

J.Pl.Dis.Sci. Vol 13(2) 2018 : 131-133

www.apsjpds.org

EVALUATION OF TURMERIC GENOTYPES AGAINST FOLIAR DISEASES, YIELD AND QUALITY ATTRIBUTES

R. S. Mishra
College of Agriculture, Azamgarh
N.D University of Agril. & Technology, Kumarganj, -224229, Faizabad, UP, India
Email: drramsumanmishra@gmail.com

Key words: Turmeric, foliar disease, tolerant, yield and quality
Received: 09-05-2018 Accepted: 20-05-2018

Turmeric (*Curcuma longa*) is a tropical crop grown in India, occupies the third position in its importance among spice crops and native to tropical South East Asia. The economic importance of turmeric is the dried rhizome. India has a 232.6 thousands ha area under turmeric cultivation with total production of 1189.90 thousand tons and productivity is 51.15q/ha (Anonymous (2014)). Turmeric crop is highly prone to several fungal diseases (Purthi, 2000). The serious foliar diseases reported in Uttar Pradesh are leaf spot caused by *Colletotrichum capsici* (Syd.) Butler & Bisby, and leaf blotch caused by *Taphrina maculans*, Butler. Despite the importance of the crop farmers fail to realize maximum potential yields because of several limiting factors, among them low yielding with foliar disease susceptible variety are one of the main region. Therefore aims of present work are evaluation and identification of genotypes for foliar disease resistance and quality yield of turmeric.

The field experiments were conducted at Vegetable farm, N.D. University of Agriculture and Technology Kumarganj, Faizabad (UP),India during 2013 -14 to 2015-16 in alluvial soil for three years. The fifteen turmeric genotypes used in present study were collected from IISR, Kozhikode, Kerala. The experiment was laid out in randomized block deign with three replications. The rhizomes were planted in beds of 3.0 x 1.0 m^2 size at a spacing 30 x 20 cm in the first week of July every year. Fertilizers N: P: K were applied @ 120 kg, 80 kg and 80 kg per ha in the form of urea, DAP and muriate of potash respectively. Other standard agronomical practices were carried out as and when required. Observations of disease severity were recorded at 110 days after planting on 10 randomly selected plants in each replication for disease scoring. All the leaves of selected plants were individually scored based on 0 – 6 point scale as suggested by Palarpawar and Ghurde, (1989). The percent disease severity (PDS) was calculated. The yield of fresh rhizome in each treatment was recorded after harvest and data of quality attributes were recorded at AICRP on spices, Solan, HP.

Promising genotypes of the India were tested three year continuously and observations are presented in table -1. Data revealed that NDH-128 was resistant against leaf spot disease with 7.87 PDS followed by moderate resistant TCP- 129 (13.94 PDS), TCP- 14 (14.12 PDS), NDH-10 (15.75 PDS) and CL-34 (20.40PDS). Rests of the entries were found moderately susceptible with 26.08 PDS to 38.77 PDS. None of genotypes were found susceptible and highly susceptible. Kar and Mahapatra (1981) reported the occurrence of different species of *Colletotrichum* on the leaves of various host plants including turmeric plant in West Bengal. Palarpawar and Ghrude (1989) reported the saprophytic colonization of *C. capsici* on turmeric leaf. *C. capsici* and *C. curcumae* competed with each other and established their colony in the susceptible dead leaf sheath of turmeric saprophytically. Nageshwar Rao *et al.* (1993) recorded the leaf spot disease incidence of 49% in the field surveyed. Palarpawar and Ghurde (1997) reported heavy losses in the yield of turmeric rhizome due to leaf spot disease incited by *C. capsici* and *C. curcumae* in Maharashtra state.

The performance of CL-34 (20.89 PDS), NDH-128 (26.47 PDS), CL- 32(27.80 PDS) and TCP-16 (28.22 PDS) were significantly tolerant against leaf blotch of turmeric in comparison to ruling variety NDH-1 (44.12 PDS). The percent disease severity of TCP-14, TCP-129, NDH-40 and NDH-10 was significantly lower than NDH-1, RH-406, RH-410, CL-59 and CL-52. Sangamaheswara Sharma and Krishnamurthy (1962) screened four short duration *Curcuma longa* and 7 long duration types of *Curcuma longa* for varietal resistance of turmeric crop against leaf spot and leaf blotch diseases and found there was considerable variability in the cultivars in the degree of tolerance to both the leaf diseases. Generally the long duration types of *C. longa* were susceptible to leaf spot

Scanned with CamScanner

J Pl Dis Sci., Vol 13(2) 2018 : 137-138

www.apppds.org

EFFECT OF CROP ROTATION ON LEAF SPOT AND LEAF BLOTCH DISEASE AND YIELD OF TURMERIC

R. S. Mishra*

College of Agriculture, Azamgarh

N.D. University of Agril. & Technology, Kumarganj, -224229, Faizabad, UP, India

*Email: dramsumanmishra@gmail.com

Key words: Turmeric, soil borne disease, crop rotation and yield

Received: 21-05-2018 Accepted: 30-06-2018

Turmeric (*Curcuma longa*) is a tropical crop grown in India, occupies the third position in its importance among spice crops and native to tropical South East Asia. The economic importance of turmeric is the dried rhizome. India has a 232.6 thousands ha area under turmeric cultivation with total production of 1189.90 thousand tons and productivity is 51.15q/ha (Anonymous 2014)). Turmeric crop is highly prone to several fungal diseases (Purthi, 2000). The serious foliar diseases reported in Uttar Pradesh are leaf spot caused by *Colletotrichum capsici* (Syd.) Butler & Bisby, and leaf blotch caused by *Taphrina maculans*, Butler. Crop rotation implies repeated sowing of the same crop in the cycle at periodical intervals because monoculture are not economically profitable to the farmers, it is due to same crop grown continuously in the same land becomes sick and unsuitable for cultivation. To overcome these problems, the work was planned to study the effect of crop rotation on management of soil borne diseases, growth and yield of turmeric.

The field experiment was conducted at Vegetable Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (UP),India during 2012-13 to 2015-16 in alluvial soil with six treatment *viz*; T-1: Monoculture of turmeric, T2: two year old crop without harvest, T3: Three year old crop without harvest, T4: Crop rotation turmeric- coriander- turmeric, T5: Crop rotation Turmeric – fenugreek – turmeric, T6: crop rotation turmeric - coriander – fenugreek – turmeric and three replication in randomized block design. The plot size was maintained 3.0 x 1.0 M size and spacing of turmeric was 30 x 20 cm. Other standard agronomical practices of crops were adopted during the experiment from sowing to harvest. Observations of turmeric diseases were recorded by using 0 -6 point scale (Palarpawar and Ghurde, 1989) from 25 October to 10 November every year. The disease severity was calculated using the formula suggested by Datar and Mayee (1981). Plant height and leaf length were measured from 15 December to 30 December. Fresh rhizome yield was recorded at the time of harvest and yield data was calculated q/ha.

The disease severity of colletotrichum leaf spot was maximum in three year old crop without harvest (56.8%) and minimum in crop rotation turmeric – coriander – fenugreek – turmeric (9.3%). The lowest percent disease severity of Taphrina leaf blotch was also in crop rotation turmeric – coriander – fenugreek –turmeric (9.33%) followed by turmeric – fenugreek – turmeric (12.46%), turmeric – coriander – turmeric(25.20%) and monoculture (34.26%). *Colletotrichum* leaf spot and *Taphrina* leaf blotch severity were significantly lowest in crop rotation and highest in three year old crop without harvest. Crop rotation minimised the survival ability of the pathogen due to lack of susceptible host in the soil. Results of present study revealed that continuous ratooning of turmeric crop enhanced the survival ability of pathogen due to presence of their regular living host that have increased the inoculums density Finding is supported with Shipton (1979). The maximum plant height was observed in three year old crop (112.73 cm) and minimum in monoculture of turmeric (76.56 cm). In case of leaf length, largest was recorded in crop rotation, turmeric – fenugreek – turmeric (49.96 cm) and smallest in monoculture (42.43 cm). The fresh rhizome yield was recorded maximum in crop rotation followed by three year old crop and monoculture crop. Monoculture crop provide the suitable environment for survival and spread of the disease inoculums which have been suppressed the growth and yield of turmeric (Curl,. 1963). Other hands crop rotation has increased antagonistic microorganism in the biotic environment because of rotational crop released different chemical residues on the decomposition substances that have favoured to plant growth with better nutritional availability.

It is concluded that four year crop rotation *viz*; turmeric – coriander – fenugreek – turmeric was found best cultural practice for management of diseases as well as higher growth and yield of turmeric. Because of

Scanned with CamScanner

Ann Dis Sci Vol 13(1) 2018 : 82-87

ISSN 0973-7456
Online ISSN 0976-7388

[illegible] COW [illegible] AND BOTANICALS ON MANAGEMENT [illegible] OSPORA [illegible] OF FENUGREEK

[illegible] S. Mishra*
[illegible] R S S Baribag, Ghazipur, N.D University of Agriculture & Technology,
Kumarganj, Faizabad-224229 UP,India
*Email:drramsumanmishra@gmail.com

Key words:
Cow products,
Botanicals,
management,
Cercospora leaf
spot, fenugreek

Received :
06-12-2017

Accepted :
27-12-2017

ABSTRACT

Cercospora leaf spot incited by *Cercospora traversiana* reported as the most destructive disease under suitable environmental conditions can cause 80 per cent reduction in yield. Seed treatment and foliar spray of cow urine, cow dung slurry, panchgavya and vanaspativash significantly decreased the percent disease intensity of Cercospora leaf spot. Percent disease intensity was recorded in seed treatment with cow Urine (13.43-33.31), cow dung slurry (13.46-35.24), Panchgavya (14.15-39.33), Vanaspativash (13.96-38.97) and Vanaspativash + cow urine+ cow dung slurry (15.51-40.29) in comparison to control (17.88- 41.34).). Foliar spray of organic treatment minimized the disease intensity from 20.08 – 21.73% in cow urine, 14.20- 22.22% in cow dung slurry, 15.55 to 22.02% in panchgavya and 14.90 - 19.50% in Vanaspativash over the control. Seed treatments and foliar spray of the organic treatments significantly increased the growth and yield of fenugreek viz. Plant height, primary branching, secondary branching and number of pods per plants and number of grain per pods. The organic treatment induced higher number of grain per pods (5.07 – 17.28%) and test weight of seed (5.46 – 13.72%) that have improve total grain yield of fenugreek (6.67- 42.62%).

The genus *Cercospora* is causing diseases in many plant species, some are economically important such as *Cercospora* leaf spot of palak caused by *Cercospora beticola* Sacc, leaf spot of peanut caused by *Cercospora arachidicola*, leaf spot of maize caused by *Cercospora zea - maydis* and *Cercospora* leaf spot of fenugreek (Zimmer, 1984). *Cercospora* leaf spots of fenugreek occurred at all the stage of plants and caused serious defoliation. Hence, considered as one of the destructive and wide spread disease of fenugreek (Acharya *et al.*, 2010). Panchgavya is an organic product for the potential source of nutrients to play important role for promoting growth and providing immunity in plant system (Pagar *et al.*, 2015). Biochemical properties of panchgavya revealed that it consist major plant nutrient like nitrogen, phosphorus, potassium and micronutrients necessary for plant growth. Thus panchgavya has been used for improving health and quality of fruit and vegetable, used as a foliar spray, soil treatment with irrigation and seed treatment (Natarajan, 2002). Cow product separately and collectively used as seed treatment and foliar spray could manage the *Cercospora* leaf spot and enhanced the growth and yield of fenugreek (Singla and Satwinder Kaur, 2016). Cow product has greatly checked the spread and spore germination of pathogen. Testing under controlled environmental conditions was done in detail, however in field condition, very few literature are available. Therefore study was carried out for management of *Cercospora* leaf spot of fenugreek with alternate management practices of cow products to enhance the yield.

MATERIAL AND METHODS

The trial was conducted in a Randomized Block Design with three replications and 11 treatments including check during *Rabi* season, 2016-17. The plot size was 2.0 X 2.4 m^2 accommodating six rows with row to row 20 cm and plant to plant distance 10 cm. Fresh cow urine and cow dung were collected in a sterile container from a local variety of cow, College of Veterinary and Animal Husbandry at Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad, Uttar Pradesh. The urine was filtered through Whatman No. 1 filter paper (to get rid of debris and precipitated material) and was stored in airtight container at 4°C temperature before use. Cow dung slurry was prepared with adding equal amount of water (w/v). Fresh five products *viz.* cow dung (3kg), cow urine (3L) [illegible]

Scanned with CamScanner

EPIDEMIOLOGY OF POTATO VIRAL DISEASES AND THEIR MANAGEMENT

*A.N. Chaubey and R.S. Mishra**
Department of Agril. Sc. & Engg., IFTM University, Moradabad
*Department of Plant Pathology N. D. U. A. T., Kumarganj,
Faizabad, (U.P.), India
Email: aditya.chaubey2011@gmail.com

INTRODUCTION

Potato is an annual, herbaceous plant belonging to the family Solanaceae. It contains about 79% water, 18% starch, 2% protein, 1% vitamins, minerals and many trace elements. Potato is the world's leading vegetable crop. It is grown in about one hundred and forty countries (Haase, 2008). Cultivation of potato is influenced by the abiotic and biotic (mesobiotic) stresses including viruses. Number of viral diseases has been reported on this crop by several workers in the world, which produced various Robert *et al.* (2000) used some epidemiological approaches to the control of aphid borne viral diseases i.e. PVY (Poty virus Y) and PLRV (Potato Leaf Roll Virus) in seed potato crops in northern Europe. PVX causes mild mosaic, interveinal chlorosis and rugosity and sometimes top necrosis. Infected plants produce few tubers which are smaller and under sized. PVX is a latent virus, therefore, sometimes unable to identify on symptom basis. About twenty viruses are known to infect potato. While most important are PVX, PVY and PLRV which cause severe damage to potato crop in Pakistan. In Pakistan, potato crop losses were reported up to 83% due to viruses (Mughal and Khalid, 1985). Severe infection can reduce yield by 40 – 70% (Purcifull and Edwardson, 1981). Potato virus X (PVX) infects more than 200 plant species, majority of which belongs to family Solanaceae (Wustman, 1978). Losses due to PVY lie between 58-83% in Pakistan (Khalid et al., 2000). It induces severe mosaic, rugosity, crinkling, necrosis and affected plants produce small size tubers. Khan (2001) studied the major potato viruses (PVX, PVY

Scanned with CamScanner

Original Research

Journal Home page : www.jeb.co.in ✉ E-mail : editorial@jeb.co.in

Journal of Environmental Biology

JEB

DOI : http://doi.org/10.22438/jeb/39/2/MS-278

Environmental factors influencing the population of whitefly and leaf curl disease incidence in chilli

Authors Info

A.N. Chaubey and R.S. Mishra*

Department of Plant Pathology, Narendra Dev University of Agriculture and Technology, Faizabad-224 229, India

*Corresponding Author Email : drramsumanmishra@gmail.com

Key words

Capsicum annum
Leaf curl disease
Whitefly

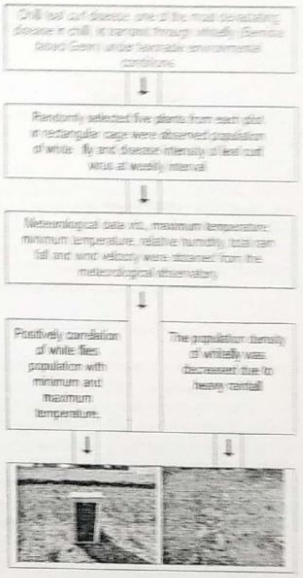
Publication Info

Paper received : 24.02.2016
Revised received : 19.07.2016
Re-revised received : 20.04.2017
Accepted : 27.06.2017

Abstract

Aim : Chilli (*Capsicum annum*) is an important spice crop cultivated all over the world. The importance of chilli leaf curl disease has been recognized for many years because it is one of the most devastating disease in chilli growing area and transmitted through the vector whitefly (*Bemisia tabaci* Genn) under favorable environmental conditions. The present study was conducted to study the effect of meteorological factors on whitefly population and incidence of chilli leaf curl virus disease.

Methodology : A rectangular cage was formed by ply wood and fiber glass. The ply wood plate was cut according to required size and made in rectangular form. Randomly selected five plants of each plot in rectangular cage were observed population of white fly and disease intensity of leaf curl virus at weekly interval starting from 20 days after transplanting at the morning hours (6-7 a.m.) on the defined day. Meteorological data viz., maximum temperature, minimum temperature, relative humidity, total rain fall and wind velocity were obtained from the meteorological observatory, Narendra Dev University of Agriculture and Technology, Faizabad.



Results : The first appearance of white fly was recorded on 10th standard week and rapid progress of white fly population was recorded from 11th standard week to 17th standard weeks in 2014 and 18th week in 2015. The increase in white fly population was positively correlated with minimum and maximum temperature. Disease incidence of chilli leaf curl virus was significant and positively correlated with white fly population (r=0.93 in 2014 and r=0.89 in 2015). The maximum percent leaf curl increase was observed on 19th standard week when white fly population was highest in the field.

Interpretation : The increase or decrease of leaf curl virus disease of chilli was directly correlated with vector population and vector population was determined by environmental factors. It is concluded that whitefly population and leaf curl incidence increased with increasing the temperature, as well as relative humidity and decreased with the occurrence of rainfall.

© Triveni Enterprises, Lucknow (India)

Scanned with CamScanner

Plant Archives Vol. 19 No. 1, 2019 pp. 383-386 e-ISSN:2581-6063 (online), ISSN:0972-5210

EFFICACY OF PLANT EXTRACTS WITH DIFFERENT SOLVENTS AGAINST *TAPHRINA* LEAF SPOT OF TURMERIC

R. S. Mishra

College of Agriculture, Azamgarh N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224229 (UP)

Abstract

Taphrina leaf spot is widely distributed in the genetic plains of Uttar Pradesh and Bihar. The foliar destruction due to leaf spot reduces the yield considerably when the disease starts in its early stages of crop growth. The herbal formulations have been described for the use in medicinal and agricultural applications. Hence field studies were carried out to select plant extracts with suitable solvent for reducing the leaf spot disease of turmeric. Plant extract with cow urine was resulted lowest disease intensity in neem (47.5%), garlic (48.4%) and onion (50.7%) followed by water based extract of neem (48.1%), onion (44.9%) and garlic (54.1%) where as highest in acetone based extract of neem (49.3%), onion (50.0%) and garlic (53.4%). The plant growth and yield of turmeric were found highest in cow urine based plant extract as compared with acetone and distilled water based plant extract.

Key words: Turmeric, *Taphrina*, leaf spot disease, cow urine, plant extracts and yield

Introduction

Turmeric (*Curcuma longa*) is a tropical crop grown in India, occupies the third position in its importance among spice crops and native to tropical South East Asia. The economic importance of turmeric is dried rhizome. India has a 232.6 thousands ha area under turmeric cultivation with total production of 1189.90 thousand tons and productivity is 51.15q/ha (Anonymous, 2014). Turmeric crop is highly prone to several fungal diseases (Purthi, 2000). The serious foliar diseases reported in Uttar Pradesh are leaf spot caused by *Colletotrichum capsici* (Syd.) Butler & Bisby, and leaf spot caused by *Taphrina maculans*, Butler. *Taphrina* leaf spot was known to report from Gujarat, Saharanpur (UP) and Rangapur in 1911. It is widely distributed in the gangetic plains of Uttar Pradesh and Bihar. The foliar destruction due to leaf spot reduces the yield considerably when the disease starts in its early stages of crop growth. The farmers are growing local clones for their desirable aroma, colour and palatability. These clones are susceptible to the disease leaf spot diseases.

The application of chemical fungicides are producing hazardous consequences in term of soil pollution, reducing the quality of arable land and ground water (Bezbaruah, 2000) and bio-pesticides are usually inherently less toxic than conventional pesticides (Singh, 1999). They generally affect only the target pathogenic organism, in contrast to broad spectrum fungicides. Fresh plant extracts from different plant parts are becoming valuable for management of the pathogens, which can be easily prepared by farmers. Cow's urine is an important constituent of Panchgavya and is used in several Panchgavya formulations (Okigbo and Nameka, 2005). Cow's urine based Nigerian herbal formulation was prepared with the use of several herbs like tobacco, garlic, lemon juice and bulbs of onion. These herbal formulations have been described for the use in medicinal and agricultural applications. (Fulzele *et al.*, 2001). Keeping in view, field studies were carried out to select suitable management practices for reducing the leaf spot disease of turmeric.

*Author for correspondence : E-mail: drramsumanmishra@gmail.com

Materials and Methods

Plant species *viz.* Neem (*Azadirachta indica)*, Onion (*Allium cepa*) and Garlic (*Allium sativum*)free from any disease were selected on the basis of their antifungal properties reported elsewhere and easy availability round the year in the field. The effectiveness of cow urine, acetone and distilled water based plant extracts were tested against naturally occurring year to year *Taphrina*

Scanned with CamScanner

Plant Archives Vol. 19 No. 1, 2019 pp. 1175-1178 e-ISSN:2581-6063 (online), ISSN:0972-5210

ECO-FRIENDLY MANAGEMENT OF TAPHRINA LEAF SPOT DISEASE OF TURMERIC

R. S. Mishra[1]* and J. P. Singh[2]

[1]College of Agriculture, Azamgarh, N.D. University of Agril. & Tech., Kumarganj-224 229, Faizabad (U.P.), India.
[2]KVK Azamgarh-II, N.D.University of Agril. & Tech., Kumarganj - 224 229, Faizabad (U.P.), India.

Abstract

Turmeric (*Curcuma longa*) is a tropical crop grown in India, occupies the third position in its importance among spice crops. The economic importance of turmeric is the dried rhizome. Turmeric crop is highly prone to several fungal diseases. The serious foliar diseases reported in Uttar Pradesh are leaf spot caused by *Taphrina maculans*, Butler. The foliar destruction due to leaf spot reduces the yield considerably when the disease starts in its early stages of crop growth. The herbal formulations have been described for the use in medicinal and agricultural applications. Hence, field studies were carried out to select plant extracts with suitable solvent for reducing the leaf spot disease of turmeric. The present study showed that all treatments were significantly superior over control for management of *Taphrina* leaf spot of turmeric in field condition. Among the treatment cow urine based botanical formulation was most effective at 90 days (44.04%) in comparison to acetone based botanical formulation (37.22%) and distilled water based botanical formulation (45.61%).

Key words : *Taphrina maculans*, leaf spot, turmeric, plant extracts, cow urine, growth, yield.

Introduction

Turmeric is very important spice in India, which produces nearly entire whole world crop and consumed 80% of it. India is by far the largest producer and exporter of turmeric in world. It has versatile uses in flavoring, dye making, drug preparation, cosmetics and medicine. Around 100 active constituents have been recorded from turmeric. This herbal plant is highly prone to several fungal diseases; one of them is Taphrina Leaf spot disease, caused by *Taphrina maculans*. The disease manifests whole leaves and reduces heavy yield loss. Managing the disease solely through the use of chemical pesticides being undesirable because of the associated risks of environmental pollution and human health, there is an all-round compulsion to go in for bio-rational alternatives. Eco-friendly disease management holds substantial importance in spice crop as most of them consumed as for direct spice purposes. Considering all these points and importance of crop, the present investigation was taken up to generate information regarding the cause of disease and tested various plant extract and mixture of these plant extract with cow urine, acetone and distilled water to find out management sources against the disease.

* *Author for correspondence :* E-mail: drramsumanmishra@gmail.com

Materials and Methods

Plant species Madar (*Calotropis procera*) and Dhatura (*Datura stramnium*) free from any disease were selected on the basis of their antifungal properties reported elsewhere and easy availability round the year in the field. The effectiveness of cow urine, acetone and distilled water based plant extracts were tested against naturally occurring year to year *Taphrina* leaf spot of turmeric in field experiment. Concentration of plant extract was selected on the basis of *in vitro* experiment on *Colletotrichum*. The field experiment was conducted at vegetable farm, Narendra Deva University of Agriculture and Technology Kumarganj Faizabad during 2014 to 2016 in sandy alluvial soil with having low organic matter and high ph 8.5. NDH-1 is susceptible variety to Taphrina leaf Spot and showed disease incidence ranging from 42.8 to 79.3% under natural condition (previous year)

Scanned with CamScanner

IJABR VOL 9 (2) 2019: 133-135

ISSN: 2250 – 3579

INTERNATIONAL JOURNAL OF ADVANCED BIOLOGICAL RESEARCH

© 2004-2019 Society For Science and Nature (SFSN). All Rights Reserved

www.sciencebeinature.org

EVALUATION OF TURMERIC GENOTYPES FOR QUALITY, YIELD AND DISEASE RESISTANT

R. S. Mishra

Department of Plant Pathology, N.D. University of Agriculture and Technology, Kumarganj -224229, UP, India

*Corresponding author: drramsumanmishra@gmail.com

ABSTRACT

Turmeric (*Curcuma longa* L.) is one of the important spice crop cultivated in tropical and subtropical countries of the world. India is the world's largest producer of turmeric and accounted 80 percent of the world's production; it occupies 6 percent area under turmeric cultivation. Productivity of this crop is low due to its cultivation on marginal lands with low fertile level, lack of improved varieties, production and protection technology. Among various diseases attacking to turmeric crop, Taphrina leaf blotch (*Taphrina maculans*) and *Colletotrichum* leaf spot (*Colletotrichum capsci*) are the most destructive disease. Out of 37 evaluated genotype three genotypes viz; NDH-136, CL-32 and ACC-79 were found moderately resistant for both *Colletotrichum* leaf spot and *Taphrina* leaf blotch disease. The percent disease intensity of leaf spot was 17.93-21.40, leaf blotch 17.30 - 23.80, curcumin 3.6- 4.8%, essential oil 6.0 – 6.8% and oleoresin 10.09 – 12.72%. Nine genotypes NDH-8, NDH-11, NDH-68, NDH-74, NDH-79, Pratibha, CSTH-9, MEDUKAR, and CL-34 were found moderately resistant for leaf spot with curcumin content 4.1-4.6%, essential oil 6.0 – 6.8% and oleoresin 10.56 - 11.90%.

KEYWARDS: Turmeric, Genotypes, Foliar diseases, Yield, Curcumin, Oleoresin, Essential oil.

INTRODUCTION

Turmeric (*Curcuma longa* L.) is one of the most important spice crops cultivated in India. It is a rhizomatous herbaceous perennial plant of the family Zingiberaceae. Turmeric is used in flavoring, dye making, drug preparation, cosmetics and medicine (Jagtap *et al*., 2013). The annual production of turmeric in India is about 1062.5 thousands metric tonnes on area 199.0 thousands hectare. In Uttar Pradesh, the area covered under turmeric cultivation is 1828 ha with production of 5149 mt tonnes (Anonymous, 2012). This crop is highly prone to several fungal diseases (Naidu, 1988; Purthi, 2000). The serious foliar diseases on turmeric reported in UP are leaf spot caused by *Colletotrichum capsici* (Syd.) Butler & Bisby and leaf blotch caused by *Taphrina maculans* Butler. The foliar destruction due to leaf blotch reduces the yield considerably when the disease starts in its early stages of crop growth. Leaf spot incited by *Colletotrichum capsici* reduces the yield in tune of 15-60% (Pruthi, 1998) and dry rhizome yield 62%. The farmers are growing local clones for their desirable aroma, colour and palatability. These clones are susceptible to the disease. The experiments were conducted to evaluate the promising genotypes of turmeric to find out the effective management tools for overcome of yield losses due to *Taphrina* leaf blotch and *Colletotrichum* leaf spot disease of turmeric. The drug yielding qualitative traits of turmeric were also studied to find out the promising elite genotypes in terms of high curcumin, oleoresin and essential oil content.

MATERIALS AND METHODS

The field experiments were conducted at Vegetable Research Farm, N.D. University of Agriculture & Technology, Kumarganj, Faizabad from 2015-2017 in sandy loam soil with leaf spot disease susceptible NDH-1 variety. The trial was laid out in randomized block design with 37 genotypes and three replications for evaluation against foliar diseases quality and yield. Rhizomes were planted on raised beds of 3 x 1 M size at spacing of 30 x 20cm in the first forty night of June. The other normal agronomical practices were adopted to raise the crop as and when necessary. The observation of leaf spot and leaf blotch intensity were recorded at 105 DAP on 10 randomly selected plants in each replication for disease scoring. The disease rating was recorded by adopting 0-6 scale (Palarpawar and Ghurde, 1989), where 0= No infection (Healthy plants), 1= 0.1 to 10 percent leaf area infected, 2= 10.1 to 20 percent leaf area infected, 3= 20.1 to 30 percent leaf area infected, 4= 30.1 to 40 percent leaf area infected, 5= 40.1 to 50 percent leaf area infected, 5= More than 50 percent leaf area infected. The percent disease intensity (PDI) was calculated according to the formula suggested by Datar and Mayee (1981) given as below:-

$$PDI = \frac{\text{Sum of rating of infected leaves in plant}}{\text{Total no. of leaves observed x maximum disease score}} \times 100$$

(288)

Scanned with CamScanner

International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 11, Issue 16, 2019, pp.-8922-8925.
Available online at http://www.bioinfopublication.org/journalarchive.php?opt=&journal=IJAS_2019&article=2019

Research Article

NARENDRA METHI-2: SCREENING OF HIGH YIELD VARIETY AND ANCILLARY OBSERVATIONS OF FENUGREEK (*Trigonella foenum graecum* L)

MISHRA R.S.*
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh, India
*Corresponding Author: Email - drramsumanmishra@gmail.com

Received: August 07, 2019; Revised: August 26, 2019; Accepted: August 27, 2019; Published: August 30, 2019

Abstract: Fenugreek (*Trigonella foenum-graecum*) is self-pollinated crop. It occupies a prime position among various seed spices grown in India. The plant leaves and seeds are widely consumed in Indo-Pak subcontinent. Fenugreek is high influence of environment on the morpho-physiological expression, therefore the aim of this work to develop new high yielding variety to perform uniformed under different environmental condition. High yielding genotype (NDM-69) was identified among the pooled germplasm of N.D. university of Agriculture & Technology Ayodhya by selection methods. The NDM-69 was evaluated for alkalinity and disease tolerance under natural field condition. This genotype has been tested at 13 centres under AICRP on Spices for yield potential. On the basis of data collected from the different centre variety Narendra methi-2 (NDM-69) has been recommended for release in the workshop of AICRP on Spices. Narendra methi-2(NDM-69) has been tested with national check Hisar Sonali and found 14.74 percent high seed yield. The yield was found variable in location to location due to variance of environmental condition .On the basis of pooled seed yield of fenugreek entries tested under the coordinated varietal trial goes 1st rank to UM-354, 2nd to AFg-5 and 3rd to NDM-69.The variety has shown strong genetic stability under different environmental conditions which can face the natural challenges and remain sustainable to produce good seed yield.

Keywords: Fenugreek, Variety, *Leaf spot disease, Growth and yield*

Citation: Mishra R.S. (2019) Narendra Methi-2: Screening of High Yield Variety and Ancillary Observations of Fenugreek (*Trigonella foenum graecum* L). International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 11, Issue 16, pp.- 8922-8925.

Copyright: Copyright©2019 Mishra R.S. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

Fenugreek (*Trigonella foenium graecum* L.) locally known as Methi is an important multipurpose winter season seed spice crop mainly grown in Rajasthan, Gujarat, Madhya Pradesh Maharashtra, Uttar Pradesh, Haryana, Punjab and Bihar. The seed of fenugreek are used as a nardiment and seasoning agent of garnishing and flavourings dishes and it has many medicinal properties like diuretic, tonic, carminative and aphrodisiac [1]. .Its tender leaves are consumed as leafy vegetable, chopped leaves are mixed in flour to prepare Paratha [2]. In India fenugreek is covering an area 93090 ha with an annual production and productivity of 112645 tonnes and 1212.2 kg/ha, respectively in year2012-13 [3]. The production potential of the crop has not been fully exploited due to lack of high yielding variety with resistant to biotic and abiotic factors. It is well known that phenotype is the product of interaction between environment and genotype. A particular genotype may express its full genetic potential only under optimum environmental conditions. Therefore, it has been observed that relative performance in a set of varieties is altered, when comparisons are made over series of environments. Stability in the performance is one of the most desirable characteristics of a genotype to be released as a variety for wide commercial cultivation and that is one of the major objectives in this programme to develop stable variety so that effects of environment on yield can be minimized. Therefore, the present investigation was planned to test newly bred lines of fenugreek for their high yield under different centre across the India.

Materials and Method:

The experimental material for present investigation was comprised sixty diverse elite lines viz:JFg 245, JFg 266,AFg 5,AFg 6, LFC 98, LFC 93 and HM 259 ,HM 280-1, UM 202, UM 354 NDM 69, NDM 72, RM 188, RM 194, Hisar sonali (NC), RMI 361 (NC) of fenugreek.

The seed materials of fenugreek genotypes were obtained from coordinated unit of AICRP on spices IISR, Kozhikode Kerala, India. The crop was sown during *rabi* 2012-13 to 2014-15 under central varietal trial (CVT) in all 13 centers viz. Ajmer, Jobner, Kota, Hisar, Jagudan, Pantnagar, Jabalpur, Dholi, Raigarh, Coimbatore, Guntur, Navsari, Kumarganj. This fenugreek line was evaluated 2.0 x 2.4 m^2 area. Row to row and plant to plant distance was kept 30 cm and 10 cm respectively in randomized block design (RBD) with three replications of each genotype at each centre. All the recommended package and practices were followed to raise the good normal crop. In addition to it, variety Narendra Methi-2 has been tested at Vegetable farm, N. D. University of Agriculture and Technology, Kumarganj, Faizabad from 2007 to 2012in the name of NDM-69.. It was also grown at different KVKs and formers field. The percent disease intensity of downy mildew was recorded at second week of March using 0-4 scale given by earlier workers. The tested entries were graded 0- No disease symptoms, 1- Resistant, 2- Moderate resistant, 3- Susceptible, 4- Highly susceptible. Growth data were recorded at the time of 50% flowering. The yield data were recorded after the harvest.

Alkalinity tolerance

The experiment has been conducted during *rabi* 2006-07 to2008-09 to identify alkalinity tolerance genotypes under greenhouse condition at 10, 20, 30 and 40 ESP level. Ten fenugreek genotypes were sown at each ESP level in three replications. Twenty seeds were sown in each pot at the depth of 2 cm. Standard agronomical practices were followed during the experiment. Yield data per plants were observed at the maturity of the seed

Results and Discussion

Narendra methi-2 has been tested from 2007-08 to 2011-12 with national check Hisar Sonali across 41 location [Table-1] revealed 14.74 percent high seed yield.

Scanned with CamScanner

J PLDis Sci., Vol 14(1) 2019 : 94-95

www.appjpds.org

EFFICACY OF FUNGICIDES AGAINST POWDERY MILDEW OF CORIANDER

R. S. Mishra*

Department of Plant Pathology, N.D. University of Agriculture and Technology Kumarganj-224229, Faizabad, (U.P.)

*Email: drramsumanmishra@gmail.com

Received : 25.11.2018 Accepted : 11.12.2018

Coriander (*Coriandrum sativum* L.), a native of Mediterrian region is now commercially grown as spice crop in India. India is the biggest producer, consumer and exporter of coriander in the world with producing 482 thousands metric tonnes from the 5305 thousand hectares and productivity of 0.9 metric tonnes per hectare in 2011-12 (Anonymous, 2012). Major coriander growing states are Andhra Pradesh, Karnataka, Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Bihar and Rajasthan. The aromatic odour and taste of coriander fruits are its essential oil containing 0.03 to 2.6 percent (Nadeem *et al.*, 2013). Coriander seeds are used as culinary herb. Although, the area and production of coriander is increasing year after year but the productivity is stagnant in spite of development of high yielding varieties and improved package of production technology. One of the major reasons behind this fact is the incidence of many diseases. Powdery mildew disease caused by *Erysiphe polygoni* is an important disease in coriander growing area of Madhya Pradesh and adjoining districts of Rajasthan and Uttar Pradesh. The disease is air borne and survives in the form of chlamydospore. The disease symptoms appear in the form of white circular patches on young parts of stems, branches, leaves, petioles and fruits, which causes severe yield losses and also deteriorate the quality of seeds. Powdery mildew disease reduces the plant growth and increased the flower drop which reduced seed formation. Affected field showed 20 -30 percent less seed production. Breeding effort to high yielding varieties with resistant to powdery mildew disease in coriander are very limited, therefore control of powdery mildew is difficult because of its air borne nature and rapid disease development with intensive cultivation of the susceptible host crop and recurrence of the disease in the same field led to explore the possibility of new generation fungicides against powdery mildew.

The experiment was conducted at Vegetable farm of N.D. University of Agriculture and Technology Kumarganj, Faizabad, (UP), India during 2014-15 to 2016-17 with thirteen treatment *viz;* T1= One foliar spray of Tebuconazole (0.1%), T2=One foliar spray of Propineb (0.2%), T3= One foliar spray of Azoxystrobin (0.1%), T4= One foliar spray of Wettable sulphur(0.2%), T5= foliar spray of Hexaconazole(0.1%), T6= One foliar spray of Propiconazole(0.1%), T7= Two foliar spray of Tebuconazole (0.1%), T8= Two foliar spray of Propineb (0.2%), T9= Two foliar spray of Azoxystrobin (0.1%), T10= Two foliar spray of Wettable sulphur(0.2%), T11= Two foliar spray of Hexaconazole(0.1%), T12= Two foliar spray of Propiconazole(0.1%), T13= Control with local powdery mildew susceptible genotype NDcor-5. The trials were laid out in randomized block design with three replications. The crop was grown during *Rabi* every year following recommended package of practices. The first spray of fungicides was given at the time of first disease symptoms appearance and second spraying was done after 15 days of first spray. Data were recorded days to maturity and yield q ha^{-1}. Powdery mildew disease was assessed on a 0-4 scale (0= no disease symptoms and 4= all the plant parts are covered with white powdery mass) as described earlier Kalra *et al.*, (1995). The data of percent disease severity of powdery mildew was recorded 15 days before harvesting.

Spraying of tebuconazole, propineb, azoxystrobin, wettable sulphur, hexaconazole and propiconazole significantly increased the yield of coriander over control and was found superior two foliar sprays over the single spray (Table 1). The minimum mean disease severity of 2014-15 to 2016-17 was recorded 8.27% in two foliar spray of tebuconazole (0.1%) followed by 8.94% in two foliar spray of propineb (0.2%), 10.93% in two foliar spray of wettable sulphur (0.2%) and 11.0% in two foliar spray of azoxystrobin (0.1%) in comparison to single spray of tebuconazole (PDS-57.23), propineb (PDS-48.12), wettable sulphur (PDS-46.91), hexaconazole (PDS-49.78), propiconazole (PDS-51.14) azoxystrobin (PDS-52.41). The yield of coriander was significantly increased in all fungicide spray in comparison to control. The highest mean yield of 2014-15 to 2016-17 was found 11.09 q/ha in two spray of tebuconazole followed by 9.67q/ha in two spray of azoxystrobin,9.66q/ha in two spray of propineb and 9.43q/ha in two spray of wettable sulphur. The yield was significantly higher in all two sprays of fungicides than single spray of fungicides. In 1929-30, powdery mildew caused by *E.polygoni* has been reported to be controlled by timely dusting of sulphur

(282)

Scanned with CamScanner

International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 11, Issue 24, 2019, pp. 9308-9309
Available online at https://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BP000027

Research Article

EVALUATION OF TURMERIC ACCESSIONS FOR TOLERANCE TO FOLIAR DISEASES

MISHRA R.S.* AND PANDEY V.P.

Department of Medicinal and Aromatic Plant, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh, India
*Corresponding Author: Email - dramsumanmishra@gmail.com

Received: December 03, 2019 Revised: December 26, 2019 Accepted: December 27, 2019 Published: December 30, 2019

Abstract: Turmeric is a sacred spices of India is seriously affected by foliar diseases caused by *Taphrina maculans* and *Colletotrichum capsici*. Although the diseases can be kept under check with repeated chemical sprays, but excessive use of fungicides pose a threat due to pollution and health hazards, which thereby attempt have been made to evaluate 15 accession of turmeric against foliar diseases. Among them NDH-128 have been found tolerant against *Colletotrichum* leaf spot (14.2 PDI) and *Taphrina* leaf blotch (25.8 PDI) diseases with good rhizome yield. However NDH-123 was tolerant against Taphrina leaf blotch and NDH-130 for *Colletotrichum* leaf spot. NDH-135 gave higher fresh rhizome yield (40.66 t/ha).

Keywords: *Turmeric, Accession, Foliar Diseases, Yield*

Citation: Mishra R.S. and Pandey V.P. (2019) Evaluation of Turmeric Accessions for Tolerance to Foliar Diseases. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 11, Issue 24, pp.- 9308-9309.

Copyright: Copyright©2019 Mishra R.S. and Pandey V.P. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Dr Vijaya Lakshmi V, Dr Bozidar Benko, Dr R.G Kala

Introduction

Turmeric (*Curcuma longa* L.) is one of the most important spice crops cultivated in India. It is a rhizomatous herbaceous perennial plant of the family Zingiberaceae. Turmeric is used in flavouring, dye making, drug preparation, cosmetics and medicine [1]. The annual production of turmeric in India is about 1062.5 thousand metric tonnes on an area of 199.0 thousand hectares. In Uttar Pradesh, the area covered under turmeric cultivation is 1628 ha with a production of 5149 MT tonnes [2]. This crop is highly prone to several fungal diseases [3,4]. The serious foliar diseases on turmeric reported in UP are leaf spot caused by *Colletotrichum capsici* (Syd.) Butler & Bisby and leaf blotch caused by *Taphrina maculans* Sutler. Among them, leaf spot is the most important disease of turmeric resulting to losses of 25.83 to 62.12% fresh weight and 42.10 to 62.10% dry weight of rhizomes, respectively [5,6]. Keeping in view of economic importance of the crop and disease, efforts were made to evaluate various turmeric accessions for tolerance to foliar diseases.

Materials and Methods

Experiment was conducted at N.D. University of Agriculture & Technology, Kumarganj, Faizabad from 2014-2017 in sandy loam soil with leaf spot disease susceptible the variety NDH-1. The trial was laid out in randomized block design with 15 turmeric accession and three replications. Rhizomes were planted on raised beds of 3 x 1m size at a spacing of 30 x 20 cm in the first fortnight of June. The other normal agronomical practices were adopted to raise the crop as and when necessary. The observation on germination was recorded at 30 DAP, leaf spot intensity was recorded 105 DAP on 10 randomly selected plants in each replication. The disease rating was recorded by adopting 0-5 scale (Pallampawar and Ghurde, 1989), where 0= No infection (healthy plants), 1=0.1 to 10 % leaf area infected, 2=10.1 to 20 percent leaf area infected, 3=20.1 to 30 % leaf area infected, 4=30.1 to 40 percent leaf area infected, 5=40.1 to 50 %leaf area infected, 5= More than 50 % leaf area infected. The percent disease intensity (PDI) was calculated according to the formula suggested by Dalal and Mayee (1981) [7]. The yield of turmeric (fresh rhizome) in each treatment was recorded after harvest. The data obtained in all the experiments were statistically analyzed.

Results and Discussion

Susceptibility of foliar diseases is variable among the accessions as usual characteristics of the turmeric plants. Accession NDH-123 was found tolerant against Taphrina leaf blotch with 25.17 percent disease intensity, NDH-128, NDH-124 and NDH-131 were found comparable with that of a NDH-123 recording 30.40-32.53 percent disease intensity of Taphrina leaf blotch. NDH-128 accession showed tolerant against Colletotrichum leaf spot (14.2 PDI) and Taphrina leaf blotch (25.80 PDI). Other accession NDH-130, NDH-123, NDH-129 and NDH-131 were also found better tolerant against Colletotrichum leaf spot with 25.9 -26.1 PDI. Rest of the accessions were considered as moderate susceptible to susceptible for both foliar diseases. In case of fresh rhizome yield, a considerable variation was existed among the accession because it is collected from different ecological situations. NDH-135 accession produced highest rhizome yield 40.66 t/ha followed by NDH-136 (37.11t/ha), NDH-134 (36.10 t/ha) and NDH-130 (35.55 t/ha). Wide variability existed among the accession were supported by earlier workers [8-10]. Yield of turmeric varies from place to place due to genetic variability and influence of environment [11]. It is concluded that cultivation of tolerant variety (NDH-128) will be beneficial not only for reducing the losses due to foliar diseases but also improves the quality and yield of turmeric.

Conclusion

NDH-128 accession was found tolerant against both foliar diseases which is a major limiting factor for cultivation of turmeric.

Application of research: NDH-128 will be useful for the farmers where foliar diseases occurring year to year and causing huge yield loss.

Research Category: Medicinal and Aromatic Plant

Acknowledgement / Funding: Author is thankful to Department of Vegetable Science and Vegetable Farm. Author is also thankful to Department of Medicinal and Aromatic Plant, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh, India

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 1558-1560
Received: 10-01-2020
Accepted: 12-02-2020

RS Mishra
Department of Medicinal and Aromatic Plants, N.D. University of Agril. & Technology, Kumarganj, Ayodhya, Uttar Parades, India

Corresponding Author:
RS Mishra
Department of Medicinal and Aromatic Plants, N.D. University of Agril. & Technology, Kumarganj, Ayodhya Uttar Parades, India

Effect of organic treatments on total phenol, Saponin and flavonoids in leaf spot infected fenugreek leaves

RS Mishra

Abstract
Fenugreek (*Trigonella foenum graecum* L.) is an important medicinal crops cultivated throughout the world. Increasing demand of medicinal plants for the pharmaceutical industry, is required to boost the production of fenugreek with minimized the infection of diseases which reduces the huge yields. therefore present study was conducted to determine the effect of organic treatments on secondary metabolites. The total phenol in healthy leaves was maximum in seed treatment with cow urine@10 %(12.24µg/g) followed by foliar spray of cow urine (11.47 µg/g) and panchgavya (11.37 µg/g). Flavonoid content was observed highest in cow urine (4.11 µg/g) and lowest in vanaspativash (2.17 µg/g). Whereas saponin content was recorded higher in seed treatment withcow urine (15.33 µg/g) and lower in foliar spray of vanaspativash (13.06 µg/g). Percent disease intensity of Cercospora leaf spot was 33.29% in seed treatment with mixture of vanaspativash, cow urine and cow dung slurry and maximum in control 41.34%.

Keywords: Fenugreek, *Cercospora*, leaf spot, organics, biochemicals

Introduction
Cercospora traversiana is only species of the *Cercospora* that can infect fenugreek (Ryley, 1989) [11]. The disease is uniformly distributed throughout the field grown for seed production. In severely infected plants only a few upper leaves remained survive. The sign of disease symptoms were surrounded by yellowish halo on older leaves stem and pods (Mishra and pandey, 2013) [6]. Fenugreek leaves and seeds have been used extensively to prepare extract and powder for medicinal uses (Basu *et. al.*, 2003). The medicinal value lies in the form of secondary metabolites produced in plants are low molecular weight in natural products. Saponin, flavonoids and total phenolics compound are widely distributed in fenugreek plants that have exerted multiple biological effects including antioxidant, free radical scavenging, anti-inflammatory and anti carcinogenic. The accumulation and oxidation of secondary metabolites are associated with defence mechanisms in plants are also known to increase especially during fungal infections (Gasper *et al.*, 1982) [4]. The activities of phenolics related enzymes and the accumulation of phenolics have been correlated with resistance to biotic stresses (Mohammad and Kazemi, 2002) [7]. Investigation in disease physiology may provide in depth understanding of host pathogen interaction. This study was therefore designed to biochemically analyse with *Cercospora* leaf spot infected fenugreek plants at maturity stage in comparison to healthy ones.

Materials and Methods
The experiment was conducted at main experiment station (MES), Department of Vegetables Science, Narendra Deva University of Agriculture & Technology, Kumarganj Faizabad during 2015-16 to 2016-17. Experimental field was sandy loam, slightly alkaline soil (pH 8.0), low in organic carbon and nitrogen, medium in phosphorus and potassium. The mechanical composition of soil constituted 64.4 per cent sand, 27.8 per cent silt and 11.3 per cent clay. Trial was conducted in a randomized block design with three replication, 11 treatments and fenugreek variety Hisar sonali was sown @ 50 g seed/plot. Seeds were sown in 3.0 X 2.4m plot size on 30 November each year with 20 X 10 cm spacing. The layout of the experiment in detail is T_1: Seed treatment with cow urine @10% concentration,T_2: Foliar spray of cow urine @10% concentration at 60 and 90 days after sowing (DAS),T_3: Seed treatment with cow dung slurry @10% concentration,T_4: Foliar spray of cow dung slurry @10% concentration at 60 and 90 days after sowing (DAS),T_5: Seed treatment with panchgavya@10% concentration,T_6: Foliar spray of panchgavya@10% concentration at 60 and 90 days after sowing (DAS), T_7:

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(2): 2247-2251
Received: 10-01-2020
Accepted: 14-02-2020

AN Chaubey
School of Agril. Sc. & Engg, IFTM University, Moradabad, Uttar Pradesh, India

RS Mishra
Department of Plant Pathology, N.D. University of Agril. & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Leaf curl disease of *Capsicum annuum* and its impact on secondary metabolites

AN Chaubey and RS Mishra

Abstract
Leaf curl disease of *Capsicum annuum* has been recognized serious problem, wherever crop is grown. Experiment was designed to observe the leaf curl incidence and biochemical changes in infected and healthy plants of nine cultivars. The lowest leaf curl incidence was recorded 2.27% and highest 85.83%. The chlorophyll content were found highest in healthy leaves (0.684 mg g^{-1}) then infected leaves(0.511 mg g^{-1}).Whereas, total phenol content was significantly lowest in leaf curl infected leaves (5.582 mg g^{-1}) as compared to healthy leaves (7.544 mg g^{-1}). The average total tannin content was observed significantly higher in healthy leaves (4.028 mg g^{-1}) as compared with infected leaves (3.128 mg g^{-1}). Out of nine cultivars total phenol (9.905 mg g^{-1}) and tannin (5.27 mg g^{-1}) contents were found maximum in Gucchedar.

Keywords: *Capsicum annuum*, Leaf curl virus, incidence, chlorophyll, phenol, tannin

Introduction
Chilli (*Capsicum annuum* L.) is an important spices crop belongs to the family solanaceae and is one of the important widely cultivated crops grown for the value of its green and ripe fruits in India. India is rich in maximum diversity of chilli varieties with differing habit, size, shape, colour and pungency of fruit. Besides, traditional use of chilli as vegetables, spices, condiments, souces and pickles, it is also used in pharmaceuticals, casmatics and beverages [24]. India produces approximately 12.60 thousands metric tonns from an area of 792.1 thousands hectare [1]. Uttar Pradesh occupies an area of 13.47 thousand hectares with production of 10.30 metric tonns [1]. The yield of chilli is much lower than potential yield of improved varieties, it is due to several other factors, lack of improved varieties against incidence of different pest and diseases are the main constraints for getting low productivity [8]. Viral diseases of plants cause economic losses to the tune of 15 billion dollars per annum on global basis [25], particularly in tropical and semitropical regions. These provide ideal conditions for the perpetuation and transmissions of viruses through vectors. Natural occurrence of several viruses have been reported on chilli (*Capsicum annuum* L.) by various workers [14], among them leaf curl virus has been reported most destructive for chilli, tomato, potato, okra, cotton and cucumber cultivation in terms of incidence and yield losses [11]. Leaf curl virus affecting chilli in India was first reported from Jodhpur during December, 2004 and emerged as a serious problem in major chilli growing area of Rajasthan with very high disease incidence upto 100 per cent plants infection in farmers' fields [18]. Leaf curl virus is a member of genus *Begomovirus,* family geminiviridae. The genome of *Begomoviruses* have a single or double stranded circular DNA of c. 2.7kb, which is encapsulated in a quasi-isometric geminate particles of C.20-30nm. During the past two decades, agricultural intensification has resulted *Begomoviruses* inciting disease out breaks in tropical and subtropical regions, causing 80 per cent yield losses of many crops [20]. The leaf curl disease was first reported from India on tomato by Vasudeva and Samraj [26]. The virus is transmitted in nature by the white fly (*Bemisia tabaci*) in a semipersistant (Circulative) manner. The minimum acquisition and inoculation feeding periods are 15-30 minutes, the latent period in the vector is more than 20 hours and virus is retained by the vector upto 20 days. Single white fly can carry a finite number of virions in the range of 600 million [27]. The investigation of plant responses to elicitors is one of the most rapidly developing lines of injury in the plant physiology. The elicitors stimulate the contact between plants and phytopathogens and thereby trigger defensive mechanisms that constrain the invasion of pathogenic viruses. The phenol and tannins are more studied biochemical, which regulate the expression of resistance genes and induced its synthesis in plant [23]. These techniques for the detection of chlorophyll, phenol and tannin have provided an opportunity to develop methods for the diagnosis of plant resistance.

Corresponding Author:
AN Chaubey
School of Agril. Sc. & Engg, IFTM University, Moradabad, Uttar Pradesh, India

Scanned with CamScanner

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1369-1372

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-1136
P-ISSN: 2349-8234
JPP 2018; SP1: 1369-1372

Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P. India

Abha Singh
Professor, Department of Family Resource Management, College of Home Science NDUAT, Kumarganj, Uttar Pradesh, India

Correspondence
Pragya Ojha
Subject Matter Specialist, Krishi Vigyan Kendra, Banda, BUAT, Banda U.P. India

Assessment of occupational health hazards among farm workers involved in agricultural activities

Pragya Ojha and Abha Singh

Abstract
Indian Farm workers are highly involved in various agricultural operations. They perform a sequential work through manual efforts. In the present investigation efforts have been made to assess the occupational risk related to various agriculture activities and to compare the physical strength of male and female farm workers, during manual method to perform agricultural operations. For the study, twenty female and twenty male subjects were selected. From this study, it has been recommended that there is dire need to create awareness among the farm workers about the low cost improved technologies related to flower cultivation which can significantly improve the livelihood security and working conditions of farm workers. It will also reduce the level of occupational risk and enhance the physical strength of the workers.

Keywords: Occupational risk, Physical strength, Agricultural Workers, Agricultural Activity

Introduction
In the context of occupational safety and health, the term 'agriculture' is generally used in a broad sense including all activities directly related to cultivating, growing, harvesting and primary processing of agricultural products, animal and livestock breeding including aquaculture, and agroforestry. Agricultural work is dangerous; workers in this industry have among the highest rates of fatalities (BLS, 2014 and Liabman *et al.* 2013). Furthermore, Wang *et al.* (2013) also mentioned that work in agriculture involves exposures to a variety of hazards, including dust, noise, thermal stress, pesticides and other chemicals, and ergonomic risk factors. As a result, agricultural workers have elevated rates of injuries and illnesses. Das *et al.* (2011) also supported that agricultural works are associated with several occupational disorders among the farmers and agriculture farming involves several types of hazardous activities including prolonged and awkward postures. Agriculture workers perform many strenuous activities. These are: spading, carrying seeds, uprooting, transplanting saplings, harvesting or cutting crops, sheafing, carrying crops, threshing, sweeping and winnowing. Therefore, the main aim of this investigation was to know the level of occupational health hazards among agriculture workers and an attempt was made to compare the physical strength of male and female farm workers during the performance of work.

Materials and Method
Selection of subject and field
From Faizabad district of Uttar Pradesh state, India, twenty male and twenty female subjects with normal health, without any major illness or cardio-vascular problems were purposively selected because only without illness or cardio- vascular problems, agricultural workers can perform the activities more efficiently. This study was conducted in the month of February-August in the year of 2016. The age range of the selected subjects was 20-55 years. Care was taken to select the female farm workers who were non pregnant and who can perform the agricultural activities regularly. The agricultural operations were performed for 7:00 A.M to12:30 P.M. and 2:00 P.M. to 5:30 P.M. Agriculture workers performed the continuous agriculture operations for 50 minutes and taking 10 minutes break.

Calibration of subjects: The subjects were calibrated with the Body Mass Index to determine their physical fitness index. The body mass index of subjects was calculated by dividing square of height (m2) to weight (kg).

Quantification of safety and Health Hazards
Semi quantitative observational tool to characterize safety and health hazards developed by Neitzel *et al.* (2014) has been used to quantify the level of safety and health hazards among

Scanned with CamScanner

7:02 IJMRA-12885.pdf

International Journal of Research in Social Sciences
Vol. 7 Issue 12, December 2017,
ISSN: 2249-2496 Impact Factor: 7.081
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

ASSESSMENT OF MUSCULO-SKELETAL DISORDER IN FLOWER PLUCKING WOMEN IN FAIZABAD DISTRICT OF UTTAR PRADESH

MANEESHA MISHRA *
Dr. ABHA SINGH **

ABSTRACT

Women play a significant and crucial role in Agriculture development, livestock production and Floriculture as a manager decision maker and skilled farm worker. In this study attempt has been made to study the role performed by farm women engaged in floriculture and to find out the MSD (Musculoskeletal disorder) and OH (Occupational Hazard) among women. The study was conducted in Faizabad District in U.P. 100 samples were taken of women involved in flower management. It was found from the study that majority of respondents (40%) suffered from the Back pain while (20%) women suffered Knee pain. The analysis of the study shows that Poor postures and finger nodes. Stress full work, unawareness of new techniques in the use of equipment and unwariness for safety measures were the reason for musculoskeletal discomforts. 70% women used foot wears due to the awareness of the advantages of it. The preferred activities by women were grading of flower (42%) as first followed by Deeping of flowers (34%), plucking of flower (12%) and storage flower (11%) respectively. The study will be use full in policy making designing women friendly implements for flower plucking and right posture training.

Key word: MSD (Musculo-Skeletal Disorder), Occupational Hazard, Knee pain, Back pain, Musculoskeletal Disorder.

* Research Scholar, Department of Home Science, Family Resource Management, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad-211007, U.P., India.

** Associate Professor Department of Home Science, Family Resource Management, Narendra Deva University of Agriculture & Technology Narendra Nagar (Kumarganj), Faizabad (U.P)

Scanned with CamScanner

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 796-801 (2017)

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

EFFECT OF SODICITY ON GROWTH OF POLYEMBRYONIC MANGO ROOTSTOCKS

***Bhanu Pratap[1], GovindVishwakarma [1], H.K. Singh [1], Chandan Kumar Singh[2], R.K. Singh[3] and Dharmendra Singh[2]**

[1]Department of Fruit Science, [2]Department of Plant Pathology, [3]Department of Extension Education
N.D.U.A. & T, Kumarganj, Faizabad ****E-mail :** drbhanupratap71@gmail.com*

ABSTRACT

The present investigation was carried out at Main Experiment Station, Horticulture, N.D. University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad during 2012-2013. The experiment was laid out in Factorial Randomized Block Design. The seedlings were planted in September, 2012 in pots having sodicity (15, 25, 35 ESP) including control (9. 10 ESP). The mango genotypes were grown for 19 months in a greenhouse before the experiment was terminated. A site with normal soil was marked and top soil upto 15 cm depth was scrapped from the site. The soil was passed through 2 mm sieve and the waste materials were removed. After proper mixing of soil, random sample were taken from the heap of the soil. The samples were analyzed for various physical and chemical constituents. The polyembryonic mango genotypes (cultivars) Bappakai, Chandrakaran, EC95-862, Goa, Kurukkan, Nekkare, Olour, Peach, Sabre, Starch and 13/1 were grown under greenhouse in pots containing soil mixtures of varying ESP namely, 9.10 (control), 15, 25 and 35. Growth of high sodium tolerant cultivars 13/1, Sabre and Olour upto 35 ESP and intermediate tolerant cultivars Bappakai, Nekkare and Kurukkan upto 25 ESP was better than other cultivars and the reduction in their growth was lesser in terms of stem length and diameter, number of leaf, size of leaf and fresh, dry weight of root than other cultivars.

Key words : *Mango, Rootstocks, Polyembryony, Genotypes, Cultivar, Factorial Randomized Block Designand Sodicity.*

The common mango (*Mangiferaindica* L.) is indigenous to north-east India and north Myanmar in the foot-hills of the Himalayas, and is said to have originated in the Indo-Burma region and considered as the fifth most important fruit crop of the world after apple, citrus, banana and grapes *(FAO Yearbook, 2000).* India still dominates the world mango production and ranks first with the total production of 18002.4 thousand MT and productivity 7.2 MT/HA from an area of 2500 thousand ha *(Anonymous, 2013).* In India mango is cultivated in almost all the states. The leading mango producing states in India are Andhra Pradesh (24.5%), Uttar Pradesh (24.4%), Karnataka (10%), Bihar (7.6%), Gujarat (5.6%), and Maharashtra (3.5%). It is cultivated in 28.85 million (M) ha in more than 100 countries speedier 0-36^0 NS of the equator. Mango is a tropical fruit grow equally well under semi- tropical conditions. In India, mango is distributed throughout the length and breadth of the country except in hilly regions above 915 meter from the mean sea level. The mango being a deep rooted tree needs soil profile of at least 2 meter depth. It has been observed that mango is equally well on alluvial as well as lateritic soils but deep black cotton soils of India have generally been considered unsuitable for mango cultivation. For mango growing the water table should be below 180 cm and a pH of 5.5 to 7.5 has been found suitable *(Singh, 1960).* Although a tropical fruit, the mango grows equally well under semi-tropical conditions. The optimum growth temperature for mango is 23.9-26.7 ^{0}C. In India, mango grows equally well both under low and heavy rainfall of 25 to 250 cm annually. The flowering of mango in India takes place as early as November-December in Rayalasema area of Andhra Pradesh, February-March in Northern India and slightly earlier January-February in eastern parts of the country. India has a rich wealth of mango germplasm with more than 1000 varieties grown throughout the country. However, only about 21 of them are commercially cultivated in different regions *(Yadav, 1997)* and few have been found as rootstock for mango growing in saline-alkali soils namely 13/1 *(Kadman et al., 1976).* Other cultivars reported as salt tolerant like Ann and Gomera-1 *(Galan-Sauco, 1997, Galan-Sauco et al., 1989),* Olour and Bappakai *(Anonymous, 1989)* have not been extensively- studied. Although these cultivars have little commercial value due to their poor fruit quality, they have potential to be used as rootstock for saline-alkali soils or places where irrigation water contains high sodium or other water soluble injurious ions for plant because these are polyembryonic cultivars and can be used as clonal rootstocks, like use of 13/1 as clonal rootstock has increased mango productivity many fold in Israel during the last two decades and Israel has become a major mango exporter to European Union recently. Hence present investigation were undertaken to study the growth performance of polyembryonic rootstocks of mango.

MATERIALS AND METHODS

The present investigation was carried out at Main Experiment Station, Horticulture, N.D.University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad during 2012-2013. A site with normal soil was marked and top soil upto 15 cm depth was

International Journal of Plant & Soil Science

34(1): 63-70, 2022; Article no.IJPSS.81077
ISSN: 2320-7035

Effect of Land Configuration and Moisture Regimes on Productivity of Hybrid Maize (*Zea mays* L.) in Summer Season

Vishuddha Nand [a*], Vinay Kumar Patel [b] and Ashish Kumar Srivastav [a]

[a] Department of LFC, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.
[b] Department of Agronomy, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i130825

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/81077

Original Research Article

Received 17 November 2021
Accepted 20 January 2022
Published 25 January 2022

ABSTRACT

An experiment was conducted on "Effect of land configuration and moisture regimes on productivity of hybrid maize (*Zea mays* L.) in summer season." during 2018-19 at Agronomy Research Farm, ANDUA and T, Kumarganj, Ayodhya (U.P.). The experiment accomplished of 12 treatment combinations and laid out in split plot design, replicated three times. The Experiment consisted of three land configuration *viz.* flat bed planting (P_1), ridge planting (P_2) and paired row planting on raised bed (P_3) were kept in main plots and four moisture regimes *viz.*0.5 IW/CPE ratio, 0.7 IW/CPE ratios, 0.9 IW/CPE ratios and 1.1 IW/CPE ratios were allotted in sub plots. The experimental results revealed that growth parameters, such as plant height, leaf area index, dry matter accumulation, days to 50 percent ear emergence and days to50 percent maturity and yield were obtained maximum with the paired row planting methods followed by ridge planting and flat bed planting and yield attributes such as number of cobs plant^{-1} , number grains row^{-1}, number of grains cob^{-1}, cob length (cm), cob girth (cm), grains weight cob^{-1}(g), cob weight (g), shelling percentage (%), grain yield (q ha^{-1}), stover yield (q ha^{-1}), and biological yield (q ha^{-1}) were also increased similarity in same treatment. In case of moisture regimes, the same trends were observed maximum when applied irrigation at 1.1 IW/CPE ratios as compared to other moisture regimes.

**Corresponding author: E-mail: vishuddhanand84nd@gmail.com;*

VOL. XII, ISSUE XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

EFFECT OF *MORINGA OLEIFERA* LEAF EXTRACTS ON CARCASS CHARACTERISTICS AND MORTALITY OF BROILER CHICKENS

A. K. Verma[1], P. S. Pramanik[1], M. K. Verma[2], Jaswant Singh[2], Ruma Devi[3], A.K. Srivastav[2]andGaurav Panday[1]
[1]Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya,
[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[3]Department of Livestock Product Technology, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India.
ajeetverma95@gmail.com

(MS Received: 25.07.2021; MS Revised: .29.08.2021; MS Accepted: 29.09.2021)
MS 2738 **(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT)**

Abstract
The present study was carried out to evaluate the influence of Moringa oleifera leaf extracts on carcass traits and mortality of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were; basal diet with no supplement (NC- negative control) and basal diet supplemented with antibiotics (PC-positive control), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE). Percent weight of various cut parts, eviscerated weight and drawn yield were evaluated after 35 days of experiment. The results showed significantly higher eviscerated weight and drawn yield percentage in Moringa extracts supplemented groups compared to PC group. PC and MOAQE group recorded significantly (P<0.05) higher drumstick % compared to NC, MOEE and MOALE group. Moringa extracts group recorded significantly (P<0.05) lower mortality than PCand NC group birds. From above results it was concluded that supplementation of Moringa extract of 1.5% Moringa oleifera leaf powder improved the carcass traits and reduced the mortality of birds.

Key words: *Broiler, Extract, Carcass, Mortality and Moringa (words in alphabetical order)*

Introduction

Major cost involved for poultry enterprise is in the form of feed. Various approaches such as feed supplements and additives are being used to obtain more net return and to minimize expenditure on feed (Agasheet *al.*, 2017). *Moringa oleifera* leaf (MOL) has fascinated great attention as a non-traditional feed component because of its unique qualities. Moringa oleiferagrows fast, drought-tolerant tree native belonging to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. Moringa is currently cultivatedglobally in the tropics and subtropics (Faheyet *al.*, 2001). Crude protein content in Moringa varies from 25% to more than 30% on a dry matter basis (Melesse et al., 2013), with a high proportion of essential amino acids (Lu *et al.*, 2016). Moringa leaves, flowers and Pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron and alpha-tocopherol (Dahot M.U., 1988). Moringa leaves are the preferred part of tree for use in animal diets as leaf meal due to high nutritional and medicinal properties (Abbas, 2013). The meat obtained from broiler chickens is an excellent source of protein, vitamins, mineralsand lower in fat content, so having a great demand among non-vegetarians(Naji *et al.*, 2013).Addition of*Moringa oleifera* leaf meal in broilers diet resulted significant increase in dressed weight, eviscerated weight and dressing percentage (Ayo-Ajasa *et al.* 2016). Dietary supplementation of Moringa leaves would be a potential strategy to improve the meat quality in broilers due to its antioxidant potential. It was further reported that phytosterols could lower malondialdehyde content and increase glutathione concentration in the breast muscle of broiler chickens (Naji *et al.*, 2013).

This study was carried out to evaluate the effect of different extracts (1 5%) of *Moringa oleifera* leaves powder as feed supplement in broiler diets on carcass characteristicsand mortality of broiler birds.

(Please correct red marks)

Materials and Methods

The present experiment was conducted after an approval from "Institutional animal ethical committee (IAEC)" was obtained vide reference number IAEC/CVSc/P-36/2019. A total of 250 one-day old Vencobb-430 strain chicks were randomly allocated into five dietary treatment groups with 5 replicates of 10 chicks in each. The chicks were kept on five dietary treatments which includes a basal diet without any additive in negative control (NC) or that supplemented with antibiotics (Positive control-PC), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE) in basal diet. Birds were fed *ad libitum* in different phases of experimental trial. The composition of formulated experimental diets as per BIS (2007) has been given in Table 1.

The chicks were kept on deep litter system under uniform standard management conditions with availability of clean, fresh and wholesome drinking water. Mortality was recorded during the entire research period. At the end of trial one bird per replicate (5 birds/treatment) were selected randomly for the carcass evaluation and sacrificed after 12 hours pre-slaughter fast though drinking of water was allowed. After complete bleeding carcass were dipped in hot water (58°C) for 1-2 minutes and feather were removed. Evisceration was done by making a slit from tip of breast bone up to the area around the cloaca. Thorough washing and cleaning were done after evisceration. After that the carcass were kept hanging on the special racks for 5-10 minutes. The visceral organs were removed by supporting the bird with one hand via the incised abdomen. Eviscerated carcasses were weighed and cut parts like thigh, drumstick, breast, wings, back, head, neck and shank were also weighed.The relative weight of dressed, drawn yield and different edible cuts were calculated as percentage of live weight.

The data were analysed under completely randomized (CRD) by employing one way analysis of variance (Snedecor and Cocran, 1994) and means of different dietary treatments were compared with Duncan multiple range test. The P value lower than 0.05 was thought-out significant.

(Please correct red marks)

Results and Discussion

Carcass characteristics:

The data pertaining to the carcass traits of broilers presented in Table 2. The results showed that the dressed weight and thigh weight of different groups was similar and showed no significant (P>0.05) effect of various Moringa extracts. The eviscerated weightof aqueous extract (72.24), ether extract (73.10) and alcoholic extract (73.09) supplemented group broilers were similar to NC (72.05) group, however significantly (P<0.05) higher than PC (70.39). The drawn yield of MOAQE, MOEE, MOALE and NC also significantly (P<0.05) higher than PC group. Leg and drumstick weight % of PC group was significantly (P<0.05) higher than MOEE and MOALE group. However, leg weight was

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]

[1]Department of Livestock Production Management

[2] Department of Livestock Farm Complex

[3]Department of Animal Genetics and Breeding

[4]Department of T.V.C.C.

College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks. 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) co of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly hig weight, lower feed intake and better FCR($P<0.05$). The body weight of chicks raised under sand and rice hull litter did n significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand li performance index of the earlier study period was significantly higher in paddy straw+ rice hulls followed by sand and ri respectively.

***Key words:** Kadaknath, feed, body weight, sand, rice hulls, litter materials*

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Srechari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth perf of kadaknath fowls

To study the feed conversion efficiency of kadaknath fow various bedding materials

Materials and Methods:

The present investigation was carried out to study the different litter materials on growth performance, feed gain Kadaknath fowl. The study was carried out at the poultry Teaching Livestock and Poultry farm of the College of V science and Animal Husbandry, N.D.U.A.T. Kumarganj, U.P., situated at a distance of 42 km away from Faizabad cit km away from Jagdishpur Industrial area at an altitude o above sea level and latitude of 26° 47' North and longitude East and it falls in Eastern plain Zone of Middle Gange region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of Nove February which comprised winter season of this region. Du period, the climatic parameters have been shown in table average minimum temperature recorded during study pe 12.54°C, while the average maximum temperature was There were a few showers of rain, ranging from 62 to 123 average was 92.5 cm during this period. The topography o almost even and most of the farm area remains dry round Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding an of Kadaknath Chicks in the brooder house. Brooding was pukka floor using deep litter system. Each group of Kadakna placed in separate pens which were visually isolated from e along with provision of adequate ventilation and artificial li brooder house.

Preparation of brooder house to receive Kadaknath chic

Brooder house was properly scrubbed and cleaned at leas before the trail began. After the house, equipments were cleaned. The house was allowed to dry out thoroughly. The equipments were fumigated using 1% formalin. Three inches litter were made on the floor. Few days before the chick equipments were arranged in brooder house and the elect were started to adjust temperature and light. The temperatu the brooder house was slightly above 35°C. The corners of space were made rounded off with cardboard and metal chi to prevent chicks from piling up in the corner. All these pre

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[1], Vishuddha Nand[1] and A.K. Srivastav[1]
[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N:L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tramadol (T_T) and lignocaine + tramadol (T_{L+T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L+T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (54.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L+T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L, T_T and T_{L+T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L+T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L+T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because hornless cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Goonewardene and Hand, 1991; Faulkner and Weary, 2000; Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with recognized methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978). The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Stangaard *et al.* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al.* 1999). The Council of Europe recommends the use of anaesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females. Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L+T}). Medication was done 5-10 minutes before disbudding. Two doses of lignocaine per bud were injected for cornual nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (°F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 254-258

Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Gupta
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

RS Yadav
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

KD Singh
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

AK Srivastav
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

Vishuddha Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK Srivastav

Abstract
An experiment was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The experiment comprised of twelve treatments *viz.* T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), T_3 (100% N through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF +50% N through FYM), T_6 (50% RDF +50% N through Poultry Manure), T_7 (50% N through FYM+50% N through Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T_9 (75% RDF +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure), T_{11} (25% RDF +75% N through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in Randomized Block Design with three replications. the results revealed that the maximum plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of nodules $plant^{-1}$ were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) fallowed by 75% RDF +25% N through poultry manure and 75% RDF +25% N through FYM.

Keywords: FYM, Poultry manure, INM, growth, RDF, plant height, and leaf

Introduction
Berseem (*Trifoliumalexandrinum* L.) is one of the most important winter forage crop of India, due to high forage yield, palatability and nutritive value. It has become a very popular as *rabi* forage in irrigated areas or all most all over the country. Berseem belongs to one of the largest and most useful plant family leguminaceae and sub family faboideae. Berseem is known as king of fodder crops and it is popular among the world. It is one of the oldest cultivated crops, domesticated in Egypt and later introduced into many other parts of the world. Berseem was introduced in India in 1903 (Roy *et al.*, 2009) [5]. It is now widespread in the irrigated regions of west and south Asia. Most of the farmers conserved the berseem as hay to get cheap, palatable and nutritive forage during scarcity periods or early winter and summer. Berseem is a cheapest source of increasing milk production as well as improving soil fertility. Berseem can be sown in early autumn and can thus provide feed before and during the colder months but the optimum conditions are 18-25 °C. If the winter temperature falls to 6-8° C the crop growth is severely affected. This is nutritious, succulent and palatable fodder available for fairly long period during winter, spring and early summer (Chaterjee and Das, 1989) [2]. Grazing is possible though less common than cutting. The most important cultural practices that need to be carefully adjusted to achieve maximum benefit from the forage grass-legume mixtures. The ability to fix atmospheric nitrogen and convert it to a useable form for plant growth is the main trait to these legumes (Allen and Allen, 1981) [1].
Poultry manure is an excellent soil amendment that provides nutrients for growing crops and also improves soil quality when applied widely, because it has high organic matter content combined with available nutrients for plant growth (Ryssen *et al.*, 1993) [7]. The application of FYM with chemical fertilizers and composted with rock phosphate to improve crops yield is very well established (Shafi *et al.*, 2012) [8]. Fertilizers play an important role in enhancing forage productivity. Chemical fertilizers are soluble and immediately available to the plants; therefore, the effect is usually direct and fast, the price is lower and they are quite high in

GENETIC STUDIES ON REPRODUCTIVE TRAITS OF HARIANA COWS

***Ashish Kumar Srivastava, Jaswant Singh and V.K. Singh**
*Assistant Professor, Department of LFC
College of Veterinary Sciences and Animal Husbandry
N.D.U.A.T., Kumarganj- Faizabad (U.P.)

Abstract

The performance records of 211 Hariana cows, progeny of 27 sires, born during the year 1966 to 1985 having at least records up to second calving were utilized in this study. These cows were maintained at D.D.D. farm, Mathura and livestock farm, Madhurikund (Mathura). The average post partum oestrus interval was estimated to be 185.43± 11.18, the heritability estimate of post partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non significant and the variation in post partum oestrus accounted due to sires was very small (8.7%) in total variation. The least squares means and their standard errors of number of service per conception were estimated to be 2.19±0.26. The heritability estimate of the number of service per conception was estimated to be 0.294±0.210. The contribution of sires was 21.8% in the total variation of the trait.

Introduction

The cow is an efficient machine for converting farm crops into useful human food like milk and milk products, which are the main source of animal protein in the diet of a large vegetarian population of the country. Hariana breed of zebu cattle has been well established dual-purpose breed known for its milk yield as well as for draught ability. The breed has reduced significantly and is continuing to decline at an alarming rate. Apart from the declining population, Hariana cattle have also deteriorated in their productivity (Joshi et al., 1995).

Materials and Methods

The present study was undertaken on Hariana cows. All the animals taken into consideration were farm bred. The data used in this investigation were collected from the pedigree sheets, milking register and breeding record of Hariana cows maintained at DDD Farm, Mathura. The performance record of 211 cows, having at least record up to second calving were collected for genetic studies. The statistical analysis of the data was carried out by using the LSMLMW (Least Squares and Maximum Likelihood Method)- Harvey (1990) PC-2 version computer programme and Henderson (1953) model were used.

Results and Discussion

The least squares mean of the post-partum oestrus interval along with their standard errors have been presented in table 1. The average post-partum interval was estimated to be 185.43±11.18 days. The frequency of animal in various PPO groups (class interval of 40 days) is about 23.69% animals had post-partum oestrus interval below 90 days. The maximum frequency of animals was in 90 to 130 days group (26.54%). Present observation is comparatively higher than the average of post-partum interval reported by Luktuke and Subramanium (1961), Singh et al., (1964), Arora et al., (1971), Acharya et al. (1971) and Khanna (1998) for Hariana cows. Whereas, Kohli and Suri, 1957, Kohli and Suri, 1960 and Tomar and Arneja, 1972 have reported comparatively higher post-partum oestrus in Hariana cattle.

Least squares analysis of variance was performed to study the effect of farm, period and session of calving are present in table 2. The perusal of the table revealed that the effect of farm was found to be non-significant on post-partum oestrus interval in Hariana cows, although the contribution of farm was highest (83.5%) in total variation. However, Ashraf et al., (2000) observed highly significant farm effect on post-partum oestrus interval. The effect of period and season of calving were found non-significant. However, Mahmoud et al., (1991) observed a significant effect of month of calving.

Heritability estimate of post-partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non-significant and the variation in PPO accounted for due to sires was very small (8.7%) in total variation. The findings were indicative of zero heritability for this trait in these animals. Similar observations were reported by Prasad (1958) for Tharparkar cattle and Singh et al., (1964) for Hariana cattle.

Conclusion

Any selection programme based on post-partum oestrus interval will not prove beneficial in these cattle because the genetic variability for this character in these animals does not seem to exist. In view of the above observations, improvement in managemental practices may lead improvement in this trait.

References

Acaraya, R.M.; Dhillon, J.S. and Agrawal, S.C. (1971). A note on the factors affecting post-partum oestrus interval in Hariana cattle. Indian J. Anim. Sci. 41 (7) : 524-525.

Arora, K.L.; Tomar, S.S. and Singal, S.P. (1971) Factor effectin the reproductive efficiency of Hariana cattle the duration of post-partum breeding interval. The Indian Veterinary Journal **48**: 1015-1019.

Joshi, B.K.; Tantia, M.S.; Kumar, P.; Gupta, Neelam; Vij, P.K.; Nivsarkar, A.E. and Sahai, R. (1995). Hariana cattle a monograph on breed characterstics. NBAGR Research Bulletin No (3), NBAGR P.B. 129, Karnal-132001, India.

Khanna, Neetu (1998). Studies on certain aspects of reproductive performance in Hariana and crossbred cattle. M.V.Sc. thesis in Vet. Obstetrics and Gynaecology submitted to C.S. Azad Univ. of Agri. And Tech. Kanpur.

Kohli, M.L. and Suri, K.R.; (1960). Longevity and Reproductivity in Hariana cattle. Indian J. of Veterinary Sci. and A.H. 27 (1): 105-110.

Luktuke, S.N. and Subramanium, P.; (1961). Studies on certain aspects of oestrus phenomenon in Hariana cattle. J.Reprod. Fert. 2: 199-200.

Singh, O.N.; Prasad, J.N. and Prasad I.B. (1964). Conception rate of Hariana and Bachur cows under artificial breeding condition in the farm. Indian Vet. J. 41: 513-520.

Tomar, N.S.; Srivastava, K.N. and Singh B.P. (1976). Heritability estimates of fertility of Hariana heifers and their age at first calving. Indian J. Ani. Health. June: 63-66.

2004). Group-II and III had significantly (P<0.05) higher change in BCS than group-I during 30 to 45 days of lactation. This observation of cows with higher BCS at calving had lost more body condition during peak lactation was in agreement with Roche *et al.* (2007), Contrary to this Jilek *et al.* (2008) observed that cows with higher BCSC were maintained high BCS for the next 5 months of lactation. The lowest value of BCS was recorded in around 60 to 75 days of lactation in cows, after that recovery in BCS started. Similarly, Pedron *et al.* (1993) also reported for Italian dairy herds. Respective correlation of BCSC and BCSL were positive and negative with FCM, Fat and SNF (Table-2) are in corroboration with Coffey *et al.* (2002). However, the correlation was significant (P<0.01) only between BCS (at calving and during lactation) and FCM (Table-2). Significant positive correlation between BCSC and FCM are in agreement with the findings of Samarutel *et al.* (2006). Contrarily, Ruegg and Milton (1995) reported that BCSC was not correlated with milk yield. BCSL and milk yield are in a significantly negative correlation is as reported by Veerkamp and Brotherstone, (1997). Kadarmideen, (2004) and Mushtaq *et al.* (2009) also reported that BCS had slightly negative correlation with fat, SNF and milk yield. Our observations are contrast to Roche *et al.* (2007b), who reported a positive correlation between BCS and fat%. Non-significant negative correlation between BCSC and SCS are in agreement with findings of Kadarmideen, (2004) who also reported a slightly negative correlation between BCSC and SCS. However, a positive significant (P<0.01) correlation had been found between BCSL and SCS corroborates with previously documented study of Berry *et al.* (Loc. cit.) and Suriyasathaporn *et al.* (2000). SCS was negatively correlated with FCM, fat%, SNF% and specific gravity but the correlation was only significant (P<0.01) between FCM and SCS (Table-2). Negative significant (P<0.01) correlation between FCM and

Table2: Correlation (2-tailed) among BCS, FCM, milk composition and SCS in cows

	BCSC	BCSL	FCM	Fat	SNF	Specific gravity	SCS
BCSC	1	0.178	0.752**	0.154	0.249	-0.235	-0.238
BCSL		1	-0.279**	-0.016	-0.011	-0.073	0.183**
FCM			1	0.071	0.045	0.007	-0.327**
Fat				1	-0.019	-0.005	-0.069
SNF					1	0.010	-0.059
Specific gravity						1	-0.046
SCS							1

**Significance level P<0.001

SCS agree with the finding of Berry *et al.* (Loc cit).

Conclusion

Negative and positive association of BCS with daily milk yield and milk composition during calving and lactation, respectively was observed in dairy bovines. Association of somatic cell score was positive with BCS at lactation and negative with FCM.

References

Berry, D. P., Lee, J. M., Macdonald, K. A., Stafford, K., Matthews, K. L. and Roche, J. R. (2007) J. *Dairy Sci.*, 90:637-648.

Buckley, F., Dillon, P., Crosse, S., Flynn, F. and Rath, M. (2000) *Livestock Production Science*, **64**:107–119.

Coffey, M. P., Simm, G. and Brotherstone, S. (2002) *J. Dairy Sci.*, **85**:2669–2678.

Dang, A. K., Prasad, S., Mukherjee J. and De, K. (2010) *9th world Buffalo Congress (Milk Production)*, 549-551.

Duncan, D B. (1955) *Biometrics* 11:1–42.

Friggens, N. C., Ingvartsen, K. L. and Emmans, G. C. (2004) *J. Dairy Sci.*, **87**:988–1000.

Gaines, W. L. (1928) *Illinois Agric. Exp. Sm. Bull.*, 308.

IDF (1984) *International Dairy federation, Belgium*, pp.15-30.

Jilek, F., Pytloun, P., Kubesova, M., Stipkova, M., Bouska, J., Volek, J., Frelich, J. and Rajmon, R. (2008) *Czech Journal Animal Science*, **53** (9): 357–367.

Kadarmideen, H. N. and Pryce, J. E. (2001) *Animal Science*, **73**: 19-28.

Mrode, R.A. and Swanson, G. J. T. (1996) *Anim. Breed.*, Abstract **64**:847–857.

Pedron, O., Cheli, F., Senatore, E., Baroli D., and Rizzi, R. (1993) *J. Dairy Sci.*, **76**: 2528-2535.

Prasad, S. (1994) Studies on body condition scoring and feeding management in relation to production performance of crossbreed dairy cattle. PhD. Thesis submitted to NDRI, Karnal, India.

Roche, J. R., Macdonald, K. A., Burke, C. R., Lee, J. M. and Berry, D. P. (2007) *J. Dairy Sci.*, **90**: 376–391.

Ruegg, P. L. and Milton, R. L. (1995) *J. Dairy Sci.*, **78**:552-564.

Samarutel, J., Ling, K., Jaakson, H., Kaart, T. and Kart, O. (2006) *Veterinaija IR Zootechnika. T.*, **36** (58): 69-74.

Suriyasathaporn, Y., Schukken, H., Nielsen, M. and Brand, A. (2000) *J. Dairy Sci.*, **83**:1248–1255.

Veerkamp, R. F., Brotherstone, S. (1997) *Animal Science*, **64**:385–392.

ASSOCIATIONS AMONG BODY CONDITION SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

Vikas Singh[1], V. K. Singh[2], P. S. Parmanik[1], A.K.Verma[1] and A.K.Srivastav[3]
[1]Department of Livestock Production Management
[2]Department of Animal nutrition
[3]Department of L.F.C
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract
To assess the associations among body condition score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of dairy cows, 50 cows (HF cross) at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<3.0, thin), group II (3.0<BCS>3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly (P<0.05) higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score (SCS) was correlated negatively with BCSC and positively with BCSL.

Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

Milk quality is as significant as the milk quantity in dairy animals. High yielding dairy cows had higher incidence of mastitis that can be assessed by somatic cell count (SCC) of milk (Kadarmideen and Bryce, 2001). Optimal body condition of dairy cow is important for obtaining elite herd and quality milk. Low or higher body reserves may pose a risk of lower milk yield and higher SCC in milk respectively (Berry et al., 2007). High yielding dairy cows exhibit negative energy balance after calving which may influence both immune and metabolic system of the individual that predispose the animals to mastitis. Body condition score had a favourable correlation with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. Hence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), Production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). The SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as SCS=$\log_{10}$SCC (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly (P<0.05) among the three groups of cows. The BCS during calving to 15 days were significantly (P<0.05) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al.*, 2000, Friggens *et al.*,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3≤BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
0	2.83^{c}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
30	2.63^{b}±0.12	2.82^{bB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
60	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
90	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
120	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: (P<0.05)
Values with different superscripts capital letter in a column differ significantly: (P<0.05)

109	3	6223.00	92	6223.33	92	9446.05	68
110	52	7367.00	74	7366.73	74	9115.69	89
111	13	6313.00	89	6313.00	89	9107.27	90
112	4	13336.00	10	13336.00	10	11727.44	4

Table-2: Rank correlations (above diagonal) and product moment correlations (below diagonal) among the different method of sire evaluation for FLMY and life-time traits

Traits	FLMY				LTMY			LTLL		
FLMY	**Method**	$\overline{D}$	**LSM**	**BLUP**	$\overline{D}$	**LSM**	**BLUP**	$\overline{D}$	**LSM**	**BLUP**
	$\overline{D}$	**1.00**	0.88**	0.74**	0.64**	0.64**	0.40**	0.39**	0.39**	0.33*
	LSM	0.93**	**1.00**	0.92**	0.58**	0.58**	0.47**	0.38**	0.38**	0.32*
	BLUP	0.72**	0.88**	**1.00**	0.40**	0.40**	0.46**	0.22	0.22	0.25
LTMY	$\overline{D}$	0.72**	0.71**	0.48**	**1.00**	1.00**	0.71**	0.86**	0.86**	0.68**
	LSM	0.72**	0.71**	0.48**	0.99**	**1.00**	0.71**	0.86**	0.86**	0.68**
	BLUP	0.42**	0.49**	0.50**	0.76**	0.76**	**1.00**	0.68**	0.68**	0.84**
LTLL	$\overline{D}$	0.31**	0.33**	0.23	0.79**	0.79**	0.72**	**1.00**	1.00**	0.79**
	LSM	0.31**	0.33**	0.23	0.79**	0.79**	0.72**	1.00**	**1.00**	0.79**
	BLUP	0.24	0.24	0.22	0.63**	0.63**	0.86**	0.80**	0.80**	**1.00**

$\overline{D}$ = Daughter's Average, LSM = Least-Squares Method, BLUP = Best Linear Unbiased Prediction
FLMY = First Lactation Milk Yield, LTMY = Lifetime Milk Yield, LTLL = Lifetime lactation length
** Significant at 1% level
* Significant at 5% level

Deulkar, P.B. and Kothekar, M.D. 1999. Sire evaluation considering first lactation yield for improvement of lifetime production in Sahiwal. *Indian J. Anim. Sci.,* **69** (4): 240-242.

Dubey, P.P. 2004. Comparison of different sire evaluation methods in dairy cattle. M.Sc. Thesis, G.B. Pant University of Agriculture and Technology, Pantnagar, India.

Dubey, P.P.; Singh, C.V. and Prasad, R.B. 2006. Relationship between sires estimated breeding values for first lactation and lifetimes traits and ranking of sires in Sahiwal and its crosses. *Indian J. Anim. Sci.,* **76** (10): 824-828.

Ilatsia, E.D.; Roessler, R.; Kahi, A.K.; Piepho, H.P. and Zarate, V. 2011. Production objectives and breeding goals of Sahiwal cattle keepers in Kenya and implication for a breeding programme. Trop. Anim. Health Prod. DOI 10.1007/s11250-011-9928-8

Pundir, R.K. and Raheja, K.L. 1994. Direct and correlated responses to selection in the first lactation and lifetime traits in Hariana and Sahiwal cows. *Indian J. Dairy Sci.,* **48** (2): 150-153.

Pundir, R.K. and Raheja, K.L. 1994. Relationship between sires estimated breeding value for first lactation and lifetime traits in Sahiwal and Hariana cattle. *Indian J. Anim. Sci.,* **64** (11): 1219-1225.

Ramesh Chander Singh, D.; Dalal, D.S. and Malik, Z.S. 2004. Genetic evaluation of sires for lifetime performance traits in Sahiwal cattle. *Indian J. Anim. Sci.,* **74** (11): 1155-1157.

Steel, R.G.D. and Torrie, J.H. 1960. Principles and Procedure of Statistics with Special Reference to the Biological Sciences. McGrew Hill Book Company Inc, New York, 550.

BREEDING VALUE ESTIMATION FOR LIFETIME IN SAHIWAL CATTLE AND CORRELATION STUDIES AMONG DIFFERENT METHODS

Jaswant Singh* , C.V. Singh, M.K. Verma and A.K. Srivastava
College of Veterinary Sciences and Animal Husbandry
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229 (UP)
*Part of the Ph.D.thesis submitted by the first author to the G.B.P.U.A. &T., Pantnagar

Abstract

The genetic worth of a sire can be measured directly but it has to be estimated either on the basis of phenotypic performance or observed value of a trait in the sire itself, or information from relatives in sex-limited traits such as milk yield.

The present investigation was undertaken on 1367 first lactation records of Sahiwal cattle maintained at GLF, Chak Ganjaria, Lucknow (U.P.) over a period of 71 years (1944-2014). The study was conducted on breeding value estimation of sires, relationship between Estimated Breeding Values (EBV's) for first lactation and life time traits using daughter's average, least-squares and best linear unbiased prediction methods of sire evaluation and effectiveness of these methods. The rank correlations among the breeding value of sires estimated from first lactation milk yield and life time milk were medium to high and highly significant (P<0.01). Therefore, the daughters of the sires selected on the basis of high first lactation milk yield would tend to produce higher life time milk yield. The product moment correlations among the estimated breeding value of the sires for first lactation traits by all the three methods ranged from medium to very high and highly significant (P<0.01) in all the three methods of sire evaluation.

Introduction

Cattle rearing has been an important source of livelihood in India and is closely associated with agricultural economy. The agriculture and allied sectors contribute nearly 14 per cent of the Gross Domestic Production. The agriculture and livestock are the main source of employment in rural areas and about 52 per cent of the population is engaged in agriculture and rearing of livestock in our country.

The effectiveness of sire evaluation is the backbone of any breed improvement programme. This investigation was planned to evaluate Sahiwal sires as its performance is remarkable in hot climate and has been recognized worldwide as one of the best milch breed (Ilatsia et al., 2011). Various sire evaluation methods viz. daughter's average, least-squares analysis and best linear unbiased prediction (B.L.U.P.) were used to evaluate the sires and their effectiveness were compared for Sahiwal cattle. The information on the production of first lactation is mainly required for getting genetic improvement through selection, since it serves as an index of life time production in dairy cows. Therefore, it is very much essential for the sire evaluation to correlate the first lactation milk yield with life time milk production.

Materials and Methods

The data for the present investigation were collected over a period of 71 years (1944-2014) from pedigree sheet of 1367 Sahiwal cows born to 112 sires maintained at Government Livestock Farm, Chakganjaria, Lucknow (U.P.). Only the sires having the records on at least three or more daughters were included in the present study. The total duration of the present study was divided into 8 periods.

Out of 8 periods 7 are of 9 years each and 8th period of 8 years only. Each year was divided into three seasons namely winter (November-February), Summer (March- June) and Rainy (July- October). In order to classify the data for different periods and seasons year and season of calving was considered for all the traits.

Statistical Analysis

Rank correlation

After estimation of breeding value of sires, the sires were given rank as per their genetic merit. The Spearman's rank correlation between breeding values of sires derived by various methods was used to judge the effectiveness of different methods. The rank correlation was estimated as per methods developed by Steel and Torrie (1960).

$$r_s = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$

Where,

r = Rank correlation coefficient

n = Number of sires under evaluation

d_i = Difference of rank between paired items under two methods

The significance of rank correlation was tested by t-test as given below

$$t = r\frac{\sum(n-2)}{(1-r^2)}$$

It was compared with t-table value with (n-2) degree of freedom.

Simple product moment correlations

The simple correlations (r) between the estimated breeding values of bulls by different sire evaluation methods were also calculated by the following formula:

$$r_{(XY)} = \frac{Cov(XY)}{\sqrt{[Var\ (x)\ \ Var\ (Y)]}}$$

Where,

$$Cov\ (XY) = \sum XY - \frac{(\sum X)\ (\sum Y)}{n}$$

$$Var\ (X) = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$Cov\ (Y) = \sum Y^2 - \frac{(\sum Y)^2}{n}$$

Where,

X, Y= The breeding value of sires estimated by two different methods

n= Number of pairs of breeding value

Rank correlation

The rank correlations of most efficient method (LSM) of sire evaluation for LTMY was statistically highly significant (P<0.01) with their values 1.00 ($\overline{D}$ and LSM), 0.71 ($\overline{D}$ and BLUP) and 0.71 (LSM and BLUP). For LTLL, the rank correlation between the different methods were 1.00 ($\overline{D}$ and LSM), 0.79 ($\overline{D}$ and BLUP) and 0.79 (LSM and BLUP). The rank correlation of estimated breeding values of LTMY between daughter's average and least squares method was very high (100%) (Table-1).

It revealed that ranking of sires for the estimated breeding value by daughter's average and least-squares method was similar while ranking of sires from BLUP was different. Similarly, for the LTLL, the rank correlation of estimated breeding values between ($\overline{D}$) and LSM was very high (100%). It revealed that ranking of sires for the estimated breeding value by $\overline{D}$ and LSM was similar while ranking of sires by BLUP was different.

Product moment correlation

The product moment correlations of most efficient method (LSM) of sire evaluation for LTMY with other two methods of sire evaluation (

EFFECT OF DIFFERENT LITTER MATERIALS ON BEHAVIOR OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[2], Gaurav Panday[1], A.K.Srivastav[2] and R.K. Verma[4]
[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract
The present study was conducted to investigate the effect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were seemed to be significantly differed in morning, noon and evening hour interval.

Keywords: Kadaknath, feed, behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over that of exotic chickens (Dessie and Ogle, 2001). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007). Various types of litter materials like sand (shields *et al.*, 2005), sawdust (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of Kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26° 47' North and longitude of 82° 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54°C, while the average maximum temperature was 24.86°C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35°C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivnathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

Journal of Pharmacognosy and Phytochemistry 2020; 9(5): 1488-1490

103

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(5): 1488-1490
Received: 06-07-2020
Accepted: 30-08-2020

Shalu Yadav
M.Sc. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Vijay Bahadur Singh
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Gulab Chand Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sharvan Kumar
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pankaj Kumar Verma
M.Sc. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Shalu Yadav
M.Sc. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Estimation of direct selection parameter in okra [*Abelmoschus esculentus*(L.) Moench]

Shalu Yadav, Vijay Bahadur Singh, Gulab Chand Yadav, Sharvan Kumar and Pankaj Kumar Verma

Abstract
The experiment was conducted at Main Experimental Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya during *Kharif*, 2019 in Randomized Block Design with three replications using thirty six genotypes of okra collected from different sources to study the correlation and path coefficients at phenotypic and genotypic levels among different quantitative characters. Characters like petiole length (0.236) average fruit weight (0.195), have positive significant and desirable association with fruit yield. Thus, there is an ample scope for improving characters through direct selection. Petiole length (0.310) average fruit weight(0.229) plant height(0.109) fruit circumference (0.032) and days to 50% flowering (0.008) were identified as most important traits which had positive direct effect on total fruit yield per plant while, the negative direct effect on yield by rest of the dependent traits were very low.

Keywords: Estimation, parameter, okra, *Abelmoschus esculentus*

Introduction

Okra is the most traditional and popular vegetable in India and it is extensively cultivated in summer and rainy season. It is one of the important vegetable crops which are grown throughout the tropical, subtropical and temperate parts of the world. It has been grown commercially in India, Turkey, Iran, Western Africa, Yugoslavia, Bangladesh, Afghanistan, Pakistan, Burma, Japan, Malaysia, Brazil, Ghana, Ethiopia, Cyprus and the Southern United States. Okra [*Abelmoschus esculentus* (L.) Moench 2n = 2x=130] is one of the important member of the family Malvaceae. Okra is an African word and is native to northern Africa including the area of Ethiopia and Sudan. It is a summer and rainy season crop and is widely cultivated from tropics to sub tropics (Kochar, 1986) [2].

Okra (*Abelmoschus esculentus* L.) is probably an amphidiploids (allotetraploid) derived from *Abelmoschus tuberculatus* (2n = 58), a wild species from India, and a species (*Abelmoschus ficulneus* (L.) Wight and Arn. ex Wight) with 2n = 72 chromosomes. Another edible okra species are *Abelmoschus caillei* (A. Chev.). Stevels occurs in the humid parts of West and Central Africa. There are strong indications that *Abelmoschus caillei*is amphidiploids with *Abelmoschus esculentus*being one of the parental species. The lowest chromosome number 2n=56 reported in *Abelmoschus angulosus* whereas, the highest chromosome number 2n=196 reported in *Abelmoschus manihot* var. *Caillei* (Singh and Bhatnagar, 1975, Siemonsma, 1982a, 1982b) [5, 6, 7]. Largest area and production is in India followed by Nigeria in the world. India ranks first in the world with 72 per cent of the total world production of okra. The information about correlation among different component of yield is necessary for designing efficient plant breeding programme through selection and for simultaneous improvement of yield components. Therefore, such information can be obtained by the studying genotypic and phenotypic correlation coefficient between yield and yield contributing characters. Path coefficients analysis is helpful in portioning the observed correlation coefficient into direct and indirect effect and there effective use in selection programme.

Materials and Methods

The research work was undertaken at the Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology Narendra Nagar (Kumarganj), Ayodhya (U.P.) India during the *Kharif*, 2019. Geographically the experimental site (Kumarganj, Ayodhya) falls under humid sub-tropical climate and is located at 26.47° N latitude and 82.12 °E longitude at an altitude of 113 meter above the mean sea level. The experiment was conducted using thirty six genotypes in Randomized Block Design with three replications.

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO
AI QUAD CAMERA

Plant Archives Vol. 19, Supplement 1, 2019 pp. 805-807 e-ISSN:2581-6063 (online), ISSN:0972-5210

COMBINING ABILITY ANALYSIS FOR QUANTITATIVE TRAITS IN BOTTLE GOURD [*LAGENARIA SICERARIA* (MOL.) STANDL.]

Avnish Kumar Yadav*, G.C. Yadav and R.C. Jaiswal
College of Horticulture & Forestry
N.D. University of Agriculture & Technology, Kumarganj, Faizabad 224229 (U.P.) India
E-mail: aknduat@gmail.com
*Corresponding author

Abstract

The present investigation were undertaken to obtain information about general and specific combining ability in parents and F_1 generation, respectively of eight parental diallel cross (excluding reciprocals) of bottle gourd [*Lagenaria siceraria* (Mol.) Standl.] at Department of Vegetable science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad. Parental line P_2 emerged good general combiner for fruit circumference, number of fruits per plant and fruit yield per plant while parent P_8 showed highly significant general combining ability effect for vine length, number of primary branches per plant and fruit length. The parent P_7 was the best general combiner for all the traits studied except average fruit weight. The cross $P_2 \times P_3$ had highest specific combining ability effects for fruit yield along with number of fruits per plant. The highest specific combining ability for number of branches per plant was indicated by cross $P_5 \times P_8$ while $P_1 \times P_3$ was the best specific combiner for vine length.

Key words **:** *Lagenaria siceraria*, combining ability analysis, GCA (general combining ability) and SCA (Specific combining ability).

Introduction

In the cucurbitaceous vegetable crops, bottle gourd is a cultivated annual monoecious species, belongs to the family cucurbitaceae, having chromosome number 2n = 22, with its high yield potential and adoptability to diverse climatic condition in India. Homozygous are considered an important aspect in any breeding programme aimed improving yield and its related attributes. The diallel mating design is very useful for preliminary evaluation of genetic studies through hybridization programme. Hence a study was undertaken to identify the best combiners among the existing germplasm as well as gene action of different quantitative characters in 8 x 8 diallel set without reciprocal to facilitate the formulation of sound breeding programme.

Materials and Methods

The experimental materials comprised of eight inbred lines namely, Pusa Naveen (P_1), NDBG-504 (P_2), NDBG-509 (P_3), NDBG-525 (P_4), NDBG-601 (P_5), NDBG-603 (P_6), NDBG-624 (P_7) and NDBG-625 (P_8) and 28 hybrids derived from the diallel mating design (excluding reciprocals). The parents and F_1's were grown during summer (*Zaid*) crop seasons of 2008 (Y_1) and 2009 (Y_2) in Randomized Block Design with three replications. The experiment was conducted in single row of 3 meters long with row to row spacing of 3 meters and plant to plant spacing of 50 cm. aparts at Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad. Six plants were maintained in each plot. The recommended agronomic practices were followed to raise a good crops. The observations were recorded for vine length (m), number of primary branches per plant, fruit length (cm), fruit circumference (cm), number of fruits per plant, average fruit weight (kg) and fruit yield per plant (kg). Combining ability variances and their effects were worked out according to Griffing (1956 b).

Results and Discussion

The mean squares due to general combining ability (gca) and specific combining ability (sca) were highly significant for all the characters indicating importance of both additive and non-additive genetic components of variance (Table-1). Similar results were also reported by Khattra *et al.* (1994). Estimates of general combining ability (gca) and specific combining ability (sca) are given in Table-2 and 3, respectively. In respect to vine length parents P_3 (0.38 and 0.25), P_8 (0.32 and 0.25) and P_7 (0.04 and 0.06) during both the years showed significantly positive gca effects. Fourteen and eight crosses were showed highly significant positive sca effects in Y_1 and Y_2, respectively, among these crosses the highest positive sca effects were in cross $P_1 \times P_3$ (1.40 and 1.65) during the both years. For increase number of branches, the best combiners were P_8 (1.10 and 1.32), P_5 (0.95 and 1.32), P_7 (0.83 and 0.34), P3 (0.75 and 0.76) and P6 (0.65 and 0.22) during both the years. The three best crosses showed positive and high

Int.J.Curr.Microbiol.App.Sci (2020) 9(10): 54-59

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 9 Number 10 (2020)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2020.910.008

Studies on Extent of Variability, Heritability and Genetic Advance in Okra [*Abelmoschus esculentus* (L.) Moench]

Shalu Yadav*, Vijay Bahadur Singh, Gulab Chand Yadav and Aniket Kumar Verma

Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

**Corresponding author*

Keywords

Variability, PCV, GCV, Heritability, Genetic advance, Okra (*Abelmoschus esculentus* (L.) Moench)

Article Info

Accepted:
04 September 2020
Available Online:
10 October 2020

ABSTRACT

The experiment was conducted at Main Experimental Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya during *Kharif*, 2019 in Randomized Complete Block Design with three replications using thirty -six genotypes of okra collected from different sources to study the extent of variability, heritability and genetic advance in per cent of mean for different quantitative traits. The analysis of variance for the design of experiment indicated highly significant differences among the genotypes for all the characters. Based on mean performance of genotypes NDO-37 (210.79) followed by NDO-26 (209.33), NDO-27 (199.41), NDO- 31 (208.97) and NDO-36 (209.12) were found as five most promising genotypes for fruits yield per plant. High magnitude PCV were observed in case of number of branches per plant (16.23) followed by fruit length (9.91), total fruit yield per plant (9.36). High heritability was estimated for total fruit yield per plant (99.3) followed by average fruit weight (93.86), petiole length (92.80) number of branches per plant (84.54). High heritability coupled with high genetic advance were estimated for number of branches per plant (84.54,28.27) followed by total fruit yield per plant (99.13, 19.11) and average fruit weight (93.86, 14.29) which indicating opportunity for high selection response.

Introduction

Okra [*Abelmoschus esculentus* (L.) Moench 2n = 2x=130] is one of the important member of the family malvaceae and is well known by many regional names as lady's finger in England, Gumbo in USA, Dherosh in Bangladesh, Huang GiuKui in China, Quingombo in Spanish, Bhindi in Pakistan and India. Okra is an African word and is native to northern Africa including the area of Ethiopia and Sudan. It is a summer and rainy season crop and is widely cultivated from tropics to sub tropics. Okra (*Abelmoschus esculentus* L.) is probably an amphidiploids (allotetraploid) derived from *Abelmoschus tuberculatus* (2n = 58), a wild species from India, and a species (*Abelmoschus ficulneus* (L.) Wight and Arn. ex Wight) with 2n = 72 chromosomes. According to Vavilov, it was probably domesticated in the Ethiopian region but, according to Murdock, it is originated in

REDMI NOTE 8 PRO
AI QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry 2020; 9(5): 3237-3239

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(5): 3237-3239
Received: 11-07-2020
Accepted: 18-08-2020

Raja Bhaiya
Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VB Singh
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Navneet Singh
Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Pankaj Verma
Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Devesh Tiwari
Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Raja Bhaiya
Research Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on genetic variability, heritability and genetic advance for growth, yield and its component traits in cucumber (*Cucumis sativus* L.)

Raja Bhaiya, VB Singh, GC Yadav, Navneet Singh, Pankaj Verma and Devesh Tiwari

Abstract
The present investigation conducted at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj) Ayodhya, involving 28 diverse genotypes of cucumber (*Cucumis sativus* L.) in Randomized Block Design replicated thrice to estimate the genetic variability, heritability (bs) and genetic advance in present of mean for planning the leading strategy in the available germplasm. The observations were recorded on different characters like- Days to first male (staminate) flower anthesis, Days to first female (pistillate) flower anthesis, Node number to first staminate flower appearance, Node number to first pistillate flower appearance, Number of primary branches per plant, Vine length (m), Days to first fruit harvest, Fruit length (cm), Fruit diameter (cm), Number of fruit per plant, Average fruit weight (g) and Marketable fruit yield per plant (kg).
The analyses of variance revealed that mean sum of squares due to genotypes were highly significant for all the traits indicating ample variation among the genotypes. The estimates of heritability in board sense and genetic advance as a percentage of mean were studied in the study. The range of heritability in board sense varied from 58.20% to 99.0%. Maximum estimates of heritability was recorded for length of fruit (99.00%). Based on mean performance of genotype NDCC-23 followed by Pusa Uday (1.700 kg), NDCC-4 (1.660 kg), NDCC-5 (1.590 kg), and NDCC-19 (1.560 kg) were found as five most promising t yield per plant.
Hence due emphasis should be given to these characters during selection for developing high yielding genotypes in cucumber.

Keywords: Cucumber, genetic variability, variation and yield

Introduction

Cucumber (*Cucumis sativus* L.) is a member of family Cucurbitaceae, which comprises of about 120 genera and more than 800 species (Rubatzky and Yamaguchi, 1999) [7]. The genus *Cucumis* comprises of about 30 different species in two groups and distributed over two geographically distinct areas. The Asiatic group, to which cucumber belongs, has been found growing wild in the South and East of Himalayas and has diploid chromosome number 2n = 2x = 14 whereas, the African group, including West Indian Gherkin (*Cucumis anguria* L.) and muskmelon (*Cucumis melo* L.) have diploid chromosome number 2n = 2x = 24, have been found wild in Africa and Middle East. The species of one group are genetically and reproductively well isolated from that of other group. Cucumber is in cultivation for last over 3000 years and is thought to be originated in India. It further spread East ward to China and West ward to Asia Minor, North Africa and Southern Europe (Seshadri and Parthasarathy, 2002) [8]. Regarding the ancestral form, Sir Joseph Hooker concluded that Indian wild cucumber (*Cucumis sativus var. hardwickii* Kitamura.) which is found growing wild in the foothills of Himalaya, as either feral or progenitor of present day cucumber. Similar and strong evidence on this aspect was given after six isozyme analysis of Indian wild cucumber carried out by Issihiki *et al.* (1992) [4]. India is the world's second largest producer of vegetables after China, whereas in India it is grown in an area of 0.078 million hectares with a production of 1.142 million tonnes with productivity of 14.64 t/ha (Anonymous, 2017) [1]. For any effective selection programme, it would be desirable to consider the relative magnitude of association of various characters with yield.
Assessment of genetic diversity could be suitable in crop breeding for diverse applications such as identifying diverse parental genotypes. Genetic diversity is the amount of heritable variability between varieties or populations of organisms. Substantial effort has been directed towards collecting, preserving and evaluating genetic variability in crops (Golabadi *et al.*, 2012) [3].

Trends in Biosciences 13(1), Print : ISSN 0974-8431, 65-69, 2020

94

To Study on Heterosis for Yield and Its Contributing Attributes in Brinjal (*Solanum melongena* L.).

P. S. YADAVA, G. C. YADAV AND V. B. SINGH

Department of Vegetable Science, ANDUA&T, Kumarganj, Ayodhya U.P
email: premvegetable@gmail.com

ABSTRACT

A Study was conducted in brinjal to estimate the magnitude of heterosis for yield and its fifteen yield components. 36 F1 hybrids generated by half diallel crosses of nine pure diverse parent and these F_1 along with 8 parents were evaluated in randomized block design with three replication at research farm of main vegetables research station at ANDUA&T, Kumarganj, Ayodhya (India). Appreciable heterosis was found over better and standard parents for all the traits studied in desirable direction. In order of merit F1 hybrids P3xP7 (46.06%) followed by P3xP9 (30.25%) and P3xP6 (27.74%) were observed significant heterosis over maximum heterobeltiosis (better parent heterosis) for fruit yield per plant. In case of standard heterosis, significant and positive heterosis over standard check pant rituraj for fruit yield per plant was observed in hybrids P1xP8 (24.44%) followed by P1xP3 (21.25%) and P3xP7 (21.11%). The present study reveals good scope for isolation of pure line from the progenies of heterotic F_1 as well as commercial exploitation of heterosis in brinjal.

Keywords *Brinjal, Heterosis, Better parent, Standard parent, Diallel.*

Brinjal is an important vegetable crop in india and is grown throughout the year. However, its is widely cultivated in both temperate and tropical regions of the globe mainly for its immature fruits as vegetables (Rai et al., 1995), but in the temperate region it is cultivated mainly during warm season. India is regarded as the primary centre of origin/diversity of brinjal (Vavilov, 1931; Bhaduri, 1951 and Genabus, 1963). Confirmation for this fact was made by Isshiki et al, (1994) based on the isozyme and morphological variation noticed in large germplasm collection from india. There are specific genotypes suited for specific preparation apart from the large genetic variation observed with regard for traits like color, shape and size of fruits. In addition, variation is also noticed for traits like vegetative growth, maturity and presence or obsence of spines on leaves, stem and fruits calyx among the indigeneous material.

To have such a kind of plant architecture, different breeding method can be employed. One of the methods employed is exploitation of hybrid vigour through hybridization. For the first time Bailey and Munson (1891) reported artificial hybridization in brinjal. However, none of the hybrid exhibited any heterosis. Nagai and Kida (1926) were probably the first to observe hybrid vigour in a cross combination of some Japanese varieties of brinjal. To obtain high yield per unit area, exploitation of hybrid vigour is one of the good way and particularly in crop like brinjal, were more seeds per fruit are obtained. Therefore, the present investigation was carried out to study the extent of heterosis in 36 F_1 hybrid over mid parent, better parent and standard parent in a diallel cross set of 9 parents, excluding reciprocals. These studies would be helpful for select potent trensgressive segregants which can be further evaluated for inhanced yield potentiat.

MATERIALS AND METHODS

The experimental material comprised of nine pure diverse parents viz, Siliguri (P1) Mukta kesi (P2), NBD-18-4 (P3), SM 6-6 (P4), Arka Nidhi (P5), Swarna Mani (P6), KS-224 (P7), Pant Rituraj (P8) and NBD-2 (P9) along with its 36 F_1 hybrids generated by half-diallel in all possible combinations excluding reciprocals during *kharif*, 2010-11. Pant Rituraj and NBD-2 used as standard check also. The experiment was laid out in randomized block design with three replications at research farm of main vegetable research station, ANDUA&T Kumarganj, Ayodhya (India) during kharif 2011-12. Each plot consisted of a single row of 10 plants. Inter and intra row spacing was kept 90 and 60 cm, respectively. The observation was recorded in five randomly selected plants from each treatment and replication for fifteen characters

REDMI NOTE 8 PRO

Trends in Biosciences 7(13): 1401-1406, 2014

Influence of IPNM on the Economics of Cauliflower (*Brassica oleracea* var. *botrytis* L.) var. Snow Crown

*ADESH KUMAR, RAMPARSAD, PREM SHANKER YADAVA, GULAB CHAND YADAV AND BANSH NARAYAN SINGH

Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Faizabad (U.P.) India
*e-mail: adesh.kumar36@gmail.com

ABSTRACT

The present experiment was carried out with cauliflower var. Snow Crown in randomized block design with three replications. The experiment comprised of eleven different treatment combinations of five different sources of nutrients including organic, inorganic and biofertilizers alone in combinations were applied following the proper procedure as per the treatments. The experimental findings revealed that the treatment T_{11} (Half dose of NPK/ha + Vermicompost @ 2.5 tonnes/ha + *Azospirillium* @ 5 kg/ha + *Vesicular Arbascular Mycorrhiza* @ 5 kg/ha) showed better response to plant growth and its attributes and quality. However, maximum yield 269.33 q/ha and 267.02 q/ha were obtained with the application of half dose of NPK/ha + Vermicompost @ 2.5 tonnes/ha + *Azospirillium* @ 5 kg/ha + *Vesicular Arbascular Mycorrhiza* @ 5 kg/ha followed by T_9 (Half dose of NPK/ha + Vermicompost @ 2.5 tonnes/ha + *Azospirillium* @ 5 kg/ha). On the basis of economic analysis, maximum cost: benefit ratio (3.18 and 3.05) was recorded with the application of half dose of NPK/ha + FYM @ 15 tonnes/ha + *Azospirillium* @ 5 kg/ha + *Vesicular Arbascular Mycorrhiza* @ 5 kg/ha (T_7) during 2009-10 and 2010-11, respectively and this treatment combination was found most beneficial and feasible for cultivation of cauliflower.

Key words *IPNM, Bio-fertilizers, Cauliflower, Yield, Economics.*

Cauliflower (*Brassica oleracea* var. *botrytis* L.) belongs to family cruciferae and most popular Cole crop among the winter vegetables. It is grown for its highly suppressed 'prefloral fleshy apical meristem' branches called "curd." Cauliflower was introduced in India in 1822 by Jemson at Saharanpur (U.P.) during the period of East-India Company. After originating in Cyprus, the cauliflower got established around Mediterranean region, particularly in Italy. India is the second largest producer of cauliflower in the world after China followed by USA, Spain, Italy and France. In India, cultivation of cauliflower is done over an area of about 321000 hectare with a production of 57,97,000 metric tonnes and their productivity is 18.1 metric tonnes per hectare. The highest production of the crop in the country are West Bengal (1.70 million tonnes), followed by Bihar (1.0 million tonnes) and Orissa (0.60 million tonnes) and highest productivity is in Maharashtra 25.30 metric tonnes) and West Bengal (25.10 metric tonnes) followed Uttar Pradesh (20.40 metric tonnes). Cauliflower shares about 4.1% of the total area under vegetables and 4.0% of the total production. However, it is at 4th rank in productivity after tapioca, cabbage and potato (Anon., 2008).

It is one of the most important and a popular vegetable crop being grown round the year throughout the country for its white and tender curd. The use of chemical fertilizers contributes a lot in fulfilling the nutrient demand of cauliflower but irregular, excessive and imbalanced application of nutrients deteriorates the physico-chemical properties of the soil and quality of the cauliflower curd. Organic/inorganic fertilizers alone does not supply the major nutrient element in required quantity hence the integrated plant nutrient management (IPNM) in cauliflower is one of the best method of supplying nutrients to the plants to maintain the soil fertility to sustain the agriculture productivity and to improve the profitability.

It has been reportedly confirmed that continuous sole use and imbalanced use of mineral fertilizers leads to decrease in nutrient uptake efficiency of plants resulting in either yield stagnation or decrease in yield (Samant *et al.*, 1992; Rubeiz *et al.*, 1993 and Rajanna, *et al.*, 1994). Therefore, there is need to increase the productivity of cabbage per unit area by integration of judicious and balanced use of mineral fertilizers with organic manures. The integrated supply and use of plant nutrients from the chemical fertilizers and organic manures have been proved to produced higher crop yields than when each applied alone. This increase in crop productivity results from their combined effect the synergistic effect, improve chemical, physical and biological properties of the soil. Manures and fertilizers are the kingpins of improved technology contributing about 50-60% increase in productivity of vegetable in India irrespective of soil and agro-ecological zone. But without an integrated supply and use of plant nutrient from chemical fertilizers and organic sources, increased production is not possible. The economics of

Journal of Pharmacognosy and Phytochemistry 2019; 8(1): 1996-1998

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 1996-1998
Received: 01-11-2018
Accepted: 03-12-2018

Satrughan Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sudhanshu Mishra
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Navin Kumar
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

VP Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Satrughan Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Direct and indirect effect of yield components on yield of eggplant (*Solanum melongena* L.) by path co-efficient analysis

Satrughan Pandey, Sudhanshu Mishra, Navin Kumar, GC Yadav and VP Pandey

Abstract
The analysis of variance for the design of experiment indicated highly significant differences among the genotypes for all the traits. Based on mean performance of genotypes NDB-5 followed by NDB-5 followed by NDB-15, NDB-6, NDB-4, NDB-7 and NDB-16 were yield per plant, fruit weight and yield per plant indicating opportunity for selection response. Yield per plant had exhibited highly significant and positive association with fruits per plant and early yield while primary branches showed negative and significant association with yield per plant. Fruits per plant, fruit weight and plant height were identified as most important traits which has direct effect on yield per plant while negative direct effect on yield showed by fruit circumference followed by plant height and days to 50% flowering on yield. Path coefficient provide an effective means of entangling direct and indirect causes of association are measure and measure the relative importance of each caused factor.

Keywords: Eggplant, *Solanum melongena* L.

Introduction

Brinjal or eggplant (*Solanum melongena* L.) is one of the most important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. It is grown in the tropics and subtropics of India and other parts of the world. It is called Brinjal in India and Aubergine in Europe. It is extensively grown in India, Japan, Indonesia, China, Bulgaria, Italy, France, USA, Pakistan, Bangladesh, Philippines and several African countries. Due to high productivity and wife adoptability, usually finds its place as the poor man's crop.

Brinjal being most important to growers and consumer, there is pressing need to increase its productivity to fulfill the increasing demands throughout the year. The information usually needed for developing high yield varieties in a particular species pertains to the extent of genetic variability for desirable train in the available germplasm. Evaluation of germplasm is the basic tool for identification of important genotypes. The great extent of natural variation present in various characters among the genotypes suggests good scope of improvement in economic. Degree of association between the various characters and direct effect of yield contributing characters on total yield, is of paramount significance in formulating an appropriate breeding strategy aimed at exploiting the inherent variability of the original population.

Materials and Methods

The present investigation entitled "Variability, character association and genetic divergence in egg plant (*Solanum melongena* L.)" was executed at Main Experiment, Station of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, during *Kharif* 2010, to find out the direct and indirect effect of yield components on yield by path coefficient analysis. The experimental field had sandy loam soil, low in organic carbon, nitrogen, medium in phosphorus, potash, and slightly alkaline in nature with pH 8.5.The mechanical composition of soil was 60.9 per cent, 27.8 per cent silt and 11.3 per cent clay. Experimental material for the study consisted of 30 genotypes including six checks (Arka Nidhi, NDB-2, SM 6-6, Pant Rituraj, KS-224 and S. Mani). The experiment was conducted in Randomized Complete Block Design with three replications. Each treatment consisted 20 plant in two row, having spacing of 60 × 45 cm with net plot size of 4.5 × 1.2 m^2. Observations were recorded on 9 quantitative characters *viz.*, days to 50% flowering, primary branches per plant, plant height (cm), Fruit weight (g), fruit circumference (cm), polar length of fruit (cm), fruits per plant, early yield per plant (g) and yield per plant.

REDMI NOTE 8 PRO
AI QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 19-22
Received: 06-11-2018
Accepted: 09-12-2018

Satrughan Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sudhanshu Mishra
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Navin Kumar
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

VP Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Satrughan Pandey
Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Studies on heterosis, combining ability and gene advance for the quantitative characters in brinjal or egg plant (*Solanum melongena* L.)

Satrughan Pandey, Sudhanshu Mishra, Navin Kumar, GC Yadav and VP Pandey

Abstract
The analysis of variance for the design of experiment indicated highly significant differences among the genotypes for all the traits. Based on mean performance of genotypes NDB-5 followed by NDB-5 followed by NDB-15, NDB-6, NDB-4, NDB-7 and NDB-16 were found as most promising genotypes for fruit yield per plant. Days to 50% flowering and plant height exhibited low value of variability. High heritability was estimated for all the traits except yield per plant followed by early yield per plant, fruit weight and yield per plant indicating opportunity for selection response. Yield per plant had exhibited highly significant and positive association with fruits per plant and early yield while primary branches showed negative and significant association with yield per plant. Fruits per plant, fruit weight and plant height were identified as most important traits which has direct effect on yield per plant while negative direct effect on yield showed by fruit circumference followed by plant height and days to 50% flowering on yield.

Keywords: Egg plant, variability, heritability, genotypes, significant

Introduction
Brinjal or egg plant (Solanum melongena L.) is one of the most important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. It is grown in the tropics and subtropics of India and other parts of the world. It is called Brinjal in India and Aubergine in Europe. It is extensively grown in India, Japan, Indonesia, China, Bulgaria, Italy, France, USA, Pakistan, Bangladesh, Philippines and several African countries. Due to high productivity and wife adoptability, usually finds its place as the poor man's crop.

Brinjal being most important to growers and consumer, there is pressing need to increase its productivity to fulfill the increasing demands throughout the year. The information usually needed for developing high yield varieties in a particular species pertains to the extent of genetic variability for desirable train in the available germplasm. Evaluation of germplasm is the basic tool for identification of important genotypes. The great extent of natural variation present in various characters among the genotypes suggests good scope of improvement in economic. Large variability ensures better chance of prosucing new forms. Heritability and genetic advance, besides degree of association between the various characters and direct effect of yield contributing characters on total yield, is of paramount significance in formulating an appropriate breeding strategy aimed at exploiting the inherent variability of the original population.

Materials and Methods
The present investigation entitled "Variability, character association and genetic divergence in egg plant (*Solanum melongena*L.)" was executed at Main Experiment, Station of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, during *Kharif* 2010, to assess variability, heritability and genetic advance for quantitative characters The experimental field had sandy loam soil, low in organic carbon, nitrogen, medium in phosphorus, potash, and slightly alkaline in nature with pH 8.5.The mechanical composition of soil was 60.9 per cent, 27.8 per cent silt and 11.3 per cent clay. Experimental material for the study consisted of 30 genotypes including six checks (Arka Nidhi, NDB-2, SM 6-6, Pant Rituraj, KS-224 and S. Mani). The experiment was conducted in Randomized Complete Block Design with three replications. Each treatment consisted 20 plant in two row, having spacing of 60 × 45 cm with net plot size of 4.5 × 1.2 m^2. Observations were recorded on 9 quantitative characters viz., days to 50% flowering,

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO

84

Journal of Pharmacognosy and Phytochemistry 2020; 9(1): 1410-1412

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2020; 9(1): 1410-1412
Received: 10-11-2019
Accepted: 13-12-2019

Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

VB Singh
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Deepak Maurya
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Manjeet Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Corresponding Author:
Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Studies on genetic divergence in sponge gourd (*Luffa cylindrica* L. Roem.)

Veerendra Kumar, VB Singh, GC Yadav, Deepak Maurya and Manjeet Kumar

Abstract
The experiment was conducted during the spring-summer season, 2017 in Eastern Uttar Pradesh, to evaluate the nature and magnitude of genetic divergence among the thirty genotypes of bitter gourd were carried out by using Mahalanobis D^2 statistics. Thirty genotypes were grouped into 7 different non-overlapping clusters. The highest number of genotypes was presented in cluster III which contained 9 entries followed by cluster V which contains 8 entries, cluster VI which contained 5 entries, cluster I which contained 4 entries, cluster IV which contained 3 entries and cluster II possess 1 entries respectively. Highest estimates of genetic advance in per cent of mean was recorded for vine length (80.31%), node number to anthesis of first staminate flower (66.23%), number of fruits per plant (45.65%), total fruit yield/plant (38.42%). Moderate genetic advance in per cent of mean was estimated in number of primary branches per plant (37.86%), node number to anthesis of first staminate flower (37.65%), fruit length (37.40%), number of nodes per vine (35.35%), average fruit weight (31.68%), fruit diameter (29.79%) whereas days to anthesis of first pistillate flower (26.12%), days to anthesis of first pistillate flower (23.80%), days to first fruit harvest (21.58%) showed low genetic advance in per cent of mean. Vine length contributed maximum towards genetic diversity (26.67%), followed by fruits per plant (25.75 %), days to anthesis of first pistillate flower (13.69%), average fruit weight (9.43%), number of primary branches per plant (8.51%), node number to anthesis of first staminate flower (7.36%), fruit length (4.37%) and total marketable fruit yield per plant in sponge gourd.

Keywords: genetic divergence and sponge gourd

Introduction

Luffa [*Luffa cylindrica* L. (Roem) *Syn.* L. *ageyeptica* Mill.] commonly called as sponge gourd, Loofah, vegetable sponge or dish cloth gourd, is a member of family Cucurbitaceae having diploid chromosome number 2n=2x=26.It originated in subtropical Asian region particularly India (Kalloo, 1993) [2]. Sponge gourd is an annual cucurbit plant produces fruits containing a fibrous vascular system with various vines and cylindrical tenangled fruit. Leaves are deltoid to nearly orbicular exteriorly, but pointed at the apex and usually three to seven lobed with dentate margin (Whitaker and Davis, 1962) [6]. Sponge gourd is monoecious crop with branches tendrils. Flowers are yellow and showy having five petals. The inflorescence of staminate flowers is on raceme, while the pistillate flowers are solitary and have short to long peduncle. It is commonly grown for its tender marketable green fruits for vegetable purpose as well as for sponge of mature fruits which is used for scrubbing of body skin and utensil purposes. Fruits are rich in Iron Vitamin A and C. It has certain medicinal uses. The cooked fruit are easily digestible and very appetizing therefore it is recommended to the patients suffering from malaria or other seasonal fevers.

Luffa *(Luffa cylindrica* (L.) MJ. Roem syn. *L. aegyptica* Mill.) commonly called as sponge gourd, loofah, vegetable sponge or dish cloth.It is one of the most important cucurbits grown extensively throughout the tropical and sub-tropical regions of the country and world, The crop belongs to the family Cucurbitaceae which includes about 118 genera and 855 species. Its unripe tender fruits are popular and well known culinary in India with good nutritive value and high yield potentials. The tender fruits are rich in carbohydrates, vitamin A, vitamin C and iron.

Material and Methods

Thirty genotypes (including Pusa Chikni as check variety) of sponge gourd having diverse origin were evaluated at Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, during the spring-summer season, 2017.

The experiment was lay out in a randomized block design with three replications in individual plot size (3m x 2.5m). The distance maintained between row to row and plant to plant was 2.5

REDMI NOTE 8 PRO

84

83

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2020; 8(1): 2096-2101
© 2020 IJCS
Received: 16-11-2019
Accepted: 20-12-2019

Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, N.D. University of Agriculture & Technology, Narendra Nagar Kumarganj Faizabad, Uttar Pradesh, India

VB Singh
Department of Vegetable Science College of Horticulture & Forestry, N.D. University of Agriculture & Technology, Narendra Nagar Kumarganj Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science College of Horticulture & Forestry, N.D. University of Agriculture & Technology, Narendra Nagar Kumarganj Faizabad, Uttar Pradesh, India

Deepak Maurya
Department of Vegetable Science College of Horticulture & Forestry, N.D. University of Agriculture & Technology, Narendra Nagar Kumarganj Faizabad, Uttar Pradesh, India

Corresponding Author:
Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, N.D. University of Agriculture & Technology, Narendra Nagar Kumarganj Faizabad, Uttar Pradesh, India

Evaluation of genetic variability, heritability and genetic advance in sponge gourd (*Luffa cylindrica* L. Roem.) for various quantitative traits

Veerendra Kumar, VB Singh, GC Yadav and Deepak Maurya

DOI: https://doi.org/10.22271/chemi.2020.v8.i1ae.8576

Abstract
The present investigation was carried out at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during summer season, to evaluate the available germplasms for yield and its component traits of 30 genotypes, with three replications in *Randomized Block Design*. The study revealed that the mean sum squares due to genotypes were significant for all the characters, through the wide range of genetic variability in the material. Genetic variability, heritability and genetic advance were studied in 13 genotypes of sponge gourd. The phenotypic coefficient of variations (PCV) was higher than the genotypic coefficients of variations (GCV) for all traits studied, indicating that the apparent variation is not only genetic but also influenced by the growing environment in the expression of the characters. The genotypic coefficients of variation and phenotypic coefficients of variation were moderate to low for all the characters except Vine length(39.53%, 40.09%) followed by node number to anthesis of first staminate flower (33.12%, 34.13%) and lower value days to first marketable fruit harvest (11.79%, 13.28%), days to anthesis of first staminate flower (12.57%, 13.69%) and days to anthesis of first pistillate flower (13.69%, 14.78%).High heritability coupled with high genetic advance was estimated for most of the traits viz., vine length (97.24%, 80.31%), node number to anthesis of first staminate flower (94.21%, 66.23%) and number of fruits per plant (92.49%, 45.65%)thus indicating that these traits had additive gene effect so that, they are more reliable for effective selection.

Keywords: Genetic variability, heritability and genetic advance, *Luffa cylindrica* L. Roem

Introduction

Luffa [*Luffa cylindrica* (L). Roem.] Commonly called as sponge gourd, Loofah vegetable sponge or dish cloth, having diploid chromosome number 2n = 2x = 26. The sponge gourd large amount of variation has been observed for many economically important traits. In India, wide range of variability is available in the land races or cultivars, in terms of qualitative characters of sponge gourd. The observations were recorded on node number to anthesis of first staminate flower, node number to anthesis of first pistillate flower, days to anthesis of first staminate flower, days anthesis of first pistillate flower, days to first fruit harvest, Vine length (m), number of nodes per vine Number of primary branches per plant, fruit length (cm), fruit diameter (cm), number of fruits per plant, average fruit weight (g) and total marketable fruit yield per plant (kg). Variability in cucurbitaceous crop occurs in the form of land races, traditional cultivars, wild relatives form and related non edible wild weedy species. In India little attention has been given for the genetic improvement of sponge gourd by collecting diverse germplasm, their morphological characterization and assessing the variability parameters like coefficient of variation. The appropriate breeding methodologies may be adopted for genetic improvement of this crop for simultaneously improvement of different characters, information regarding mutual relationship among the characters and direction of correlation analysis provides an effective means of finding out direct and indirect causes of association among causal variables. Though the literature in respect of germplasm evaluation variability and correlation studies in sponge gourd is not meager but these are based on testing of limited number of germplasm. Moreover, the results of the earlier studies on such aspects are relevant only for the materials and environments involved in the particular study and cannot be generalized.

Indian Journal of Traditional Knowledge
Vol 21(2), April 2022, pp 414-424

Traditional agroforestry systems and practices of Assam

Yashmita-Ulman[a,*], Awadhesh Kumar[b] & Madhubala Sharma[b]

[a]Department of Silviculture & Agroforestry, College of Horticulture & Forestry, ANDUAT, Kumarganj 224 229, Ayodhya, Uttar Pradesh, India

[b]Department of Forestry, NERIST, Nirjuli 791 109, Itanagar, Arunachal Pradesh, India

E-mail: yashmita2018@gmail.com

Received 27 January 2020; revised 01 June 2021

Agroforestry is an age-old practice in Assam, the Northeastern state of India. But the documentation of such traditional practices is very meagre. Assam has six agro-ecological zones. This paper attempts to present the different types of traditional agroforestry systems practiced in North bank plains of agro-ecological zone of Assam. The documentation was done through direct observations. A questionnaire survey was done of 500 households in 250 villages distributed across four districts (Dhemaji, Lakhimpur, Sonitpur and Darrang) of Assam. Altogether 11 types of traditional agroforestry systems are recorded. Homegarden is the most common agroforestry system in all the four districts followed by aquaforestry and commercial crops trailed on support trees. The least common agroforestry system is *Machilus*-based agroforestry system and this system is not recorded from Darrang and Sonitpur districts of Assam. The choice of species and their planting pattern are influenced by their tradition, usage pattern and need of the agroforestry system's owner. These traditional agroforestry systems are a part of their traditional knowledge which is intervened with their traditions and culture. It is a blend of time-tested knowledge of indigenous species, their compatibility and species planting pattern such that the yield is maximized. So, the documentation of these environment-friendly traditional practices is essential to advocate climate-smart and sustainable approach in agriculture.

Keywords: Assam, Aquaforestry, *Areca*-based cropping, Live fence, *Machilus*-based agroforestry

IPC Code: Int. Cl.[22]: A01D 9/00, A01G 23/00

The traditional agroforestry is a human-managed land-use system in which woody perennials are intentionally grown in association with agricultural crops, pastures as well as livestock. Most of these traditional farming practices are rainfed and for household consumption purposes. The crops planted, the crop combination and the sequence of cropping in these traditional practices depend upon the edaphic, climatic, topographic conditions of the area and socio-economic status of the people. These practices are passed on from generation to generation but are not documented. In the recent years, these traditional ways of farming and cultivation are gaining importance as these practices are sustainable and environment-friendly. Therefore, emphasis is being given on documentation of these fast-depleting traditional methods of cultivation.

The traditional agroforestry systems and its practices have been documented in many countries such as Africa[1], China[2], Turkey[3] and Bangladesh[4]. In India, though agroforestry is being practiced from ancient times, only a few authors have documented these practices. A thorough literature review highlighted an inventory of the existing agroforestry systems in different states of India such as Kerala[5], Uttar Pradesh[6], Meghlaya[7], Arunachal Pradesh[8], Chattisgarh[9] and Nagaland[10]. Four agroforestry systems namely rainfed agrihorticultural system (*Cocos nucifera, Areca catechu, Citrus* sp., *Zingiber officinale, Curcuma longa*), silvipastoral systems (*Artocarpus* sp., Napier grass, Guinea grass), silvihortipastoral systems (*Bombax ceiba*, Thatch) and irrigated silviagrosystem (*Azadirachta indica, Oryza sativa* and oilseeds) are reported from Assam[11].

It is quite evident from the above that traditional agroforestry systems are present in Northeast India, and there is only a single case of inventory of the systems practiced in Assam. This shows that many agroforestry systems and practices still remain to be documented from this region. Therefore, there is a need to capture the local and traditional plant management practices before these are lost forever. Also, with the increasing

*Corresponding author

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 July 2020 | 12(10): 16230–16238
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
DOI: https://doi.org/10.11609/jott.5754.12.10.16230-16238
#5754 | Received 03 February 2020 | Final received 04 July 2020 | Finally accepted 10 July 2020
PLATINUM OPEN ACCESS

COMMUNICATION

Negative human-wildlife interactions in traditional agroforestry systems in Assam, India

Yashmita-Ulman [1], Manoj Singh [2], Awadhesh Kumar [3] & Madhubala Sharma [4]

[1] Department of Silviculture and Agroforestry, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh 224229, India.
[2] Department of Zoology, Kalinga University, Near Mantralaya, Naya Raipur, Chhattisgarh 492101, India.
[3,4] Department of Forestry, North Eastern Regional Institute of Science and Technology, Nirjuli, Arunachal Pradesh 790109, India.
[1] yashmita2018@gmail.com (corresponding author), [2] msingh.zooku@gmail.com,
[3] tpileatus@gmail.com, [4] mbs_madhu@yahoo.co.in

Abstract: Traditional agroforestry systems are designed to provide maximum and diverse yield (ranging from agricultural crops, forest trees, livestock and fish) to people. They also act as sources of food and shelter to wild animals leading to crop destruction, livestock depredation and injuries to people giving rise to negative human-wildlife interactions. The present study was carried out in three different agroforestry systems namely tea gardens, homegardens, and agrisilvicultural systems in Assam to document the attitude of people towards wild animals which damage the crops and livestock, through questionnaire surveys. In agroforestry systems, 13 animals were reported as destructive; rodents at 13% followed by Indian Hare at 12%. The least destructive were birds and bats with 4% each. In tea gardens majority of the people killed animals for meat (95%) and the most common method for killing was the use of catapults (77%). In homegardens and agrisilvicultural systems, owners chased the animals away (82%) by using catapults (68%). Hunting of animals and intolerance of people towards crop destruction and livestock depredation done by wild animals were the two main reasons causing negative human-wildlife interactions in agroforestry systems. The present study concludes that wildlife species found in the agroforestry system in Assam were threatened by local inhabitants and thus, a suitable conservation awareness and policy action plan should be developed in consultation with the owners of agroforestry systems by considering the ecological significance of the wildlife species found therein.

Keywords: Agrisilvicultural systems, agroforestry systems, crop destruction, destructive wildlife species, homegardens, tea gardens.

Editor: Mewa Singh, University of Mysore, Mysuru, India. **Date of publication:** 26 July 2020 (online & print)

Citation: Yashmita-Ulman, M. Singh, A. Kumar & M. Sharma (2020). Negative human-wildlife interactions in traditional agroforestry systems in Assam, India. *Journal of Threatened Taxa* 12(10): 16230–16238. https://doi.org/10.11609/jott.5754.12.10.16230-16238

Copyright: © Yashmita-Ulman et al. 2020. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: CSIR, New Delhi funded the project titled "Studies on Contribution of Agroforestry Systems in Wildlife and Biodiversity Conservation in Northeast India", Sanction No. 37(1585)/13/EMR-II.

Competing interests: The authors declare no competing interests.

Author details: DR. YASHMITA-ULMAN, works as Assistant Professor in Department of Silviculture & Agroforestry, ANDUAT, Ayodhya, on agroforestry systems. Her research interests include plant-animal interactions, forest ecology and wildlife conservation. DR. MANOJ SINGH works as Assistant Professor in Department of Zoology, Kalinga University, Chhattisgarh. He is working on bird acoustics and wildlife conservation using GIS. DR. AWADHESH KUMAR works as an Associate Professor in Department of Forestry, NERIST (Deemed-to-be-University), Nirjuli, Itanagar, Arunachal Pradesh. He works on population and beahvioural ecology of threatened mammalian species and other wildlife of northeast India. His interest lies in ecological process related to wildlife conservation and forest management under the umbrella of forestry research. PROFESSOR (MRS.) MADHUBALA SHARMA also works in the Department of Forestry, NERIST (Deemed-to-be-University), Arunachal Pradesh. She is specialized in the field of wood science & technology and non-timber forest products.

Author contribution: Y-U did the fieldwork and wrote the article. MS helped with the data compilation and analysis. AK and MS edited and finalized the manuscript.

Acknowledgements: We are extremely grateful to all the owners of the agroforestry systems, viz. home gardens, agrisilviculture and tea garden for permitting to carry out the present study as well as for sharing valuable information about presence of wildlife and human-wildlife interactions. Authors are thankful to Director and Head of Department, Forestry for their administrative support and to CSIR, New Delhi for providing financial support.

Acta Ecologica Sinica 42 (2022) 188–197

Contents lists available at ScienceDirect

Acta Ecologica Sinica

journal homepage: www.elsevier.com/locate/chnaes

Density, habitat associations and conservation status of *Gekko gecko* (Tokay gecko) in human-dominated landscapes around Nameri Tiger Reserve, Assam, India

Yashmita-Ulman [a], Manoj Singh [b,*]

[a] Department of Silviculture and Agroforestry, College of Horticulture & Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India
[b] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh, India

ARTICLE INFO

Article history:
Received 14 November 2020
Received in revised form 16 March 2021
Accepted 17 March 2021
Available online 5 April 2021

Keywords:
Homegardens
Habitat preferences
Tree preference
People's attitude
Distance from forest
Source of income
Gender

ABSTRACT

This study conducted from January to June 2018, attempts to determine the density, habitat preferences and attitudes of people towards *Gekko gecko* and its impact on the conservation of this species in human-dominated landscapes in Sonitpur district, Assam. Eight villages at different distances from Nameri Tiger Reserve were chosen for the study. The line transects analyzed using DISTANCE software estimated a density of 7.99 individuals ha^{-1} in fringe villages of Nameri Tiger Reserve which also had higher number of host tree species diversity with higher basal area and density as compared to that of villages distant from Nameri Tiger Reserve. *Gekko gecko* was sighted on a total of 30 trees (6 species, 2 families), the highest being *Ficus rumphii* (40%). Maximum sightings of *Gekko gecko* was done on trees (67%). The occurrence of *Gekko gecko* was highly influenced by distance from forest (12%), followed by source of income (11%) and gender (4%). The majority of the respondents (53.54%) revealed that *Gekko gecko* occurred naturally in the homegardens implying that homegardens provided the habitat that can support the populations of *Gekko gecko*. But 46.45% of the respondents reported that they were adopted (62.16% in villages distant from Nameri Tiger Reserve), which raises serious concerns about the conservation of *Gekko gecko* in homegardens. Though, majority of the people knew that it is illegal to trade *Gekko gecko*, the financial benefits of its trade is very alluring. To make homegardens more favourable for the survival of *Gekko gecko* there should be strict law enforcement, upgradation of the species in the IUCN Red List and options for alternative livelihood.

© 2021 Ecological Society of China. Published by Elsevier B.V. All rights reserved.

1. Introduction

Biodiversity conservation is a challenge for the conservationists, as the tropical forests are getting depleted, fragmented and isolated into human-modified landscapes [31,33]. Moreover, the protected areas set aside to protect the species and its habitat [5] are under constant human pressure [27]. Many studies have suggested that the natural habitats outside protected areas also have the ability to conserve species diversity [23]. So, the need of the hour is to conserve biodiversity in these rapidly increasing human-dominated landscapes which are outside the protected areas. But the anthropogenic pressure in these landscapes alters the ecosystems processes [45]. The existence of native fauna in such areas depends upon their ability to traverse through the modified habitats, patches and to adjust with the constant changes in their habitat [13]. Reptiles are conspicuous and abundant in nature making them good candidates for studies on understanding the impact of habitat change [20]. As reptiles are found in diverse habitats and niches, they are very sensitive to landscape level changes and deforestation [22,59]. They are also vulnerable to the micro-habitat level changes due to their ectothermic nature [42]. Yet studies have shown a high persistence of reptiles in altered habitats [54,60].

Northeastern India is known to harbor a good reptile diversity (121 species) with a high percentage of endemic and threatened species [44]. But as conversion of tropical forests into tea plantations, agricultural lands, human habitations etc. is very rapid in the northeastern states of India, it leads to fragmentation, deforestation [10–12] and thus habitat loss and decline in reptilian species [57]. The Sonitpur district of Assam alone has reported conversion of well stocked forests into human-dominated landscapes leading to an overall loss of 232.19 km^2 of forest between 1994 and 2001 [55]. The human-dominated systems like homegardens, agricultural lands, cacao and coffee plantations interspersed with secondary forest patches and remnant vegetation are known to harbor rich reptilian diversity comparable to the adjacent forests [50,60,61]. But in such human-dominated areas, the attitudes of the local communities plays an important role in the conservation of species as such areas are known for their negative interactions with faunal species [66,67]. Due to the dearth of information on the population density

* Corresponding author.
E-mail address: msingh.zooku@gmail.com (M. Singh).

https://doi.org/10.1016/j.chnaes.2021.03.004
1872-2032/© 2021 Ecological Society of China. Published by Elsevier B.V. All rights reserved.

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 July 2021 | 13(8): 19011–19028
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
https://doi.org/10.11609/jott.7089.13.8.19011-19028
#7089 | Received 15 January 2021 | Final received 14 May 2021 | Finally accepted17 June 2021

OPEN ACCESS

COMMUNICATION

Bird composition, diversity and foraging guilds in agricultural landscapes: a case study from eastern Uttar Pradesh, India

Yashmita-Ulman [1] & Manoj Singh [2]

[1] Department of Silviculture & Agroforestry, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh 224229, India.
[2] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh 492101, India.
[1] yashmita2018@gmail.com, [2] msingh.zooku@gmail.com (corresponding author)

Abstract: Birds have a significant role in maintaining the ecological balance of agro-ecosystems. But yet there is no documentation related to bird diversity in the agricultural landscapes of eastern Uttar Pradesh. This study was conducted from March 2019 to February 2020 using fixed radius point count method in Ayodhya district of eastern Uttar Pradesh. A total of 139 bird species belonging to 107 genera, 49 families and 15 orders were recorded from the study area. Passeriformes was the most dominant order with 28 families and 76 species. Accipitridae and Muscicapidae were the most diverse families with 11 species each and RDi value of 7.91. Among the recorded bird species, 105 species (76%) were resident, 29 species (21%) were winter visitors and only 5 species (4%) were summer visitors. According to the feeding guilds, omnivores (46 species, 33%) were highly represented, followed by insectivores (31%), carnivores (25%), granivores (6%), frugivores (4%) and nectarivores (1%). The Sohawal tehsil was found to have the highest species richness and a Shannon-Weiner diversity index (133, 4.30). *Aquila nipalensis* and *Neophron percnopterus* were the two 'Endangered' species, *Antigone antigone* and *Clanga hastata* were the two 'Vulnerable' species and *Ciconia episcopus*, *Gyps himalayensis*, *Mycteria leucocephala* and *Psittacula eupatria* were the four 'Near Threatened' species found in this region. In addition to this, the region also supported 31 species (22%) whose global population trend is decreasing. This study provides a baseline data on the bird diversity present in agricultural landscapes of this region. Based on which further studies should be designed to understand the factors influencing the diversity of birds in these agricultural landscapes which are continuously subjected to anthropogenic pressures.

Keywords: Ayodhya, Avifauna checklist, community parameters, feeding guilds, relative diversity, species richness.

Hindi: पारिस्थितिकी तंत्र के पारिस्थितिक संतुलन को बनाए रखने में पक्षियों की महत्वपूर्ण भूमिका होती है लेकिन अभी तक पूर्वी उत्तर प्रदेश के कृषि परिदृश्य में पक्षी विविधता से संबंधित कोई भी शोध उपलब्ध नहीं है। यह अध्ययन पूर्वी उत्तर प्रदेश के अयोध्या जिले में निश्चित त्रिज्या बिंदु गणना पद्धति का उपयोग करके मार्च 2019 से फरवरी 2020 तक आयोजित किया गया था। अध्ययन क्षेत्र से 107 वंशों 49 कुलों 15 गणों से संबंधित कुल 139 पक्षी प्रजातियों को दर्ज किया गया था। 28 कुलों और 76 प्रजातियों के साथ पैसेरीफार्मिस सबसे प्रमुख गण था, एक्सीपिट्रीडी और मस्सीकैपिडी सबसे अधिक विविधता वाले कुल थे जिनमें से प्रत्येक में 11 प्रजातियां थी और आरडीआई मान 7.91 था। दर्ज की गई पक्षी प्रजातियों में 105 प्रजातियां स्थानीय थी 21% प्रजातियां शीतकालीन आगंतुक थी और केवल 5 प्रजातियां विषम कालीन आगंतुक थी। फीडिंग गिल्ड के अनुसार 40 प्रजातियां सर्वाहारी थी इसके बाद 21% कीटभक्षी, 25% मांसाहारी, 6% दानाभक्षी, 4% फलभक्षी और 1% मकरंद आहारी थी। सोहावल तहसील में उच्चतम प्रजाति समृद्धि और शैनन विनर विविधता सूचकांक (133,4.30) पाया गया। एक्विला निपालेंसिस और नियोफ्रान पक्नोनोप्टेरस दो संकटग्रस्त प्रजातियां थी, एंटीगोन और कर्लेंगा हस्तटा दो सुभेद्य (वल्नेरेबरल) प्रजातियां थी और सिकानिया एपिस्कोपस, जिप्स हिमालयेंसिस, माक्टेरिया ल्यूकोसेफला और सिटाकुला यूपेट्रिया चार संभावित संकटग्रस्त प्रजातियां थी जो इस क्षेत्र में पाई जाती है। इसके अलावा इस क्षेत्र में पाई जाने वाली प्रजातियों में से ३१ प्रजाति ऐसी भी थी जिनकी वैश्विक जनसंख्या लगातार कम हो रही है। यह अध्ययन कृषि परिदृश्य में पक्षियों की विविधता को समझने के लिए भविष्य के अनुसंधानो के लिए एक महत्वपूर्ण साधन साबित हो सकता है, विशेषकर उन क्षेत्रों के लिए जो मानव जनित दबावों का सामना कर रहे हैं।

Editor: Hem S. Baral, Charles Sturt University, Albury, Australia. **Date of publication:** 26 July 2021 (online & print)

Citation: Yashmita-Ulman & M. Singh (2021). Bird composition, diversity and foraging guilds in agricultural landscapes: a case study from eastern Uttar Pradesh, India. *Journal of Threatened Taxa* 13(8): 19011–19028. https://doi.org/10.11609/jott.7089.13.8.19011-19028

Copyright: © Yashmita-Ulman & Singh 2021. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: Self-funded.

Competing interests: The authors declare no competing interests.

For **Author details** and **Author contributions** see end of this article

Acknowledgements: The authors are thankful to the Dean, College of Horticulture and Forestry, ANDUAT, for permitting to carry out this field research. Our special thanks to Mr. Abhishek Kumar Pandey for translating the abstract in Hindi.

Agric Res
https://doi.org/10.1007/s40003-020-00525-9

FULL-LENGTH RESEARCH ARTICLE

Conservation of Plant Diversity in Agroforestry Systems in a Biodiversity Hotspot Region of Northeast India

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 18 January 2020 / Accepted: 15 October 2020
© NAAS (National Academy of Agricultural Sciences) 2021

Abstract In Assam, a north-eastern state of India, most of the traditional agroforestry systems are still practised. The plant species composition of three agroforestry systems namely homegardens tea gardens and agrisilvicultural systems, were assessed using quadrat method. A total of 516 plant species belonging to 241 genera under 91 families were recorded, which consisted of 134 trees, 143 shrubs (67 shrub species and 76 species of saplings) and 239 herbs (93 herb species, 33 climber species and 113 species of seedlings). Homegardens had the highest species richness (475 plant species) belonging to 234 genera under 90 families. This was followed by agrisilvicultural systems (101 spp., 43 genera, 29 families), and the least was in tea gardens (79 spp., 41 genera, 25 families). The highest average number of plant species per system was recorded in homegarden (108.96 ± 5.96, range 23–207 spp.). A negative correlation was found between the agroforestry system plot size and plant species richness. Sorenson's similarity index showed a very low degree of similarity in the plant species recorded among the three selected systems. Out of 516 plant species recorded across the different agroforestry systems, 1.0% species (n = 3) were vulnerable (*Aquilaria malaccensis, Saraca asoca* and *Santalum album*), 8.9% species (n = 46) were least concerned, 1.6% species (n = 8) were data deficient and 88.6% species (n = 457) were not assessed. Only homegarden recorded all the three plant species under the vulnerable category of IUCN Red List. It can be concluded that the agroforestry systems, specially the homegardens harbour rich plant diversity and act as miniature versions of natural forests by conserving rare, threatened and data-deficient plant species. The results suggest that the agroforestry systems with some management interventions need to be promoted as conservation models in areas with high pressure on tropical forests.

Keywords Assam · Agroforestry system · Homegardens · Tea gardens · Plant species richness

Introduction

Traditionally, the farmers have been known to retain tree cover in agricultural landscapes, around home spaces and in cash crop plantations as shade trees. Apart from these traditional practices, the increasing rate of tropical deforestation has led to an increase in number of forest or secondary forest growth fragments intermingled with human-managed landscapes consisting of agriculture and plantations. These current forms of land-uses usually known as agroforests have now become the prominent landscapes which have a potential of conserving the natural and native vegetation [25]. These agroforestry systems not only provide food, fruits, vegetables, medicines and fuel but also

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s40003-020-00525-9) contains supplementary material, which is available to authorized users.

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Agroforestry, College of Horticulture and Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India

[2] Department of Zoology, Kalinga University, Naya Raipur, Chhattisgarh, India

[3] Department of Forestry, NERIST, Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Published online: 17 March 2021

Proc Zool Soc
https://doi.org/10.1007/s12595-021-00361-x

RESEARCH ARTICLE

Conservation of Wildlife Diversity in Agroforestry Systems in Eastern Himalayan Biodiversity Hotspot

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 14 January 2020 / Revised: 22 February 2021 / Accepted: 1 March 2021
© Zoological Society, Kolkata, India 2021

Abstract The highly diverse tropical forests are fast being depleted and converted into isolated fragments which endangers the existence of wild animals. These fragments are interconnected by human-dominated agroforestry systems. To conserve the wild animals it is important that such agroforestry systems have the potential habitat to support the survival of the enormous regional biota. The present study was carried out in agroforestry systems (agrisilviculture systems, home gardens and tea gardens) in Assam to understand their role in conservation of different biological groups (mammals, birds, butterflies, reptiles and frogs). Total visual count method was deployed in home gardens and agrisilviculture system and line transects were laid in tea gardens for recording the faunal diversity. Altogether, 364 animal species (consisting of 14 mammal species, 185 bird species, 133 butterfly species, 18 reptilian species and 14 amphibian species) were recorded from the selected study sites of agroforestry systems. The highest animal diversity was found in home garden (311 spp.), followed by tea garden (275 spp.) and agrisilviculture system (187 spp.). Out of the 364 species recorded, only 1.09% were threatened (endangered and vulnerable) species and 1.37% were near threatened species according to the IUCN Red List. Wild animal species richness was significantly and negatively associated with distance from forest and positively associated with fruiting and flowering vegetation. Thus, the agroforestry systems with their flowering and fruiting vegetation, though cannot substitute the forest habitat but can be useful in providing shelter to the generalist species and their populations.

Keywords Home gardens · Tea gardens · Agrisilviculture systems · Mammals · Birds · Butterflies

Introduction

Highly diverse ecosystems like the tropical forests, are being converted or deforested for agricultural expansion, developmental projects and land-use intensification (Pastur et al. 2012). It has resulted in habitat loss, degradation, fragmentation (Harris and Silva-Lopez 1992) leading to biodiversity loss (Flynn et al. 2009). One possible and effective solution to conserve biodiversity may be to manage the remaining contagious forest areas as protected areas and manage the human-dominated agricultural landscapes (Schroth et al. 2004) by adopting age-old methods of agroforestry. Agroforestry is the intentional growing of woody perennials along with annual crops and/or animals in the same unit of land (Nair 1993). Assam, a part of Northeast India region falls under the east Himalayan biodiversity hotspot. This state has abundant forms of agroforestry systems in place since ancient times. Ahmed and Hazarika (2007) broadly classified the agroforestry systems present in Assam into five types namely, Agri-horticultural system (*Ricinus communis*/*Sesamum indicum*/

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12595-021-00361-x.

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Silviculture and Agroforestry, College of Horticulture and Forestry, ANDUAT, Uttar Pradesh, Ayodhya, India

[2] Department of Zoology, Kalinga University, Raipur, Chhattisgarh, India

[3] Department of Forestry, NERIST, Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Published online: 19 March 2021

Proc Zool Soc
https://doi.org/10.1007/s12595-020-00335-5

RESEARCH ARTICLE

Agroforestry Systems: A Boon or Bane for Mammal Conservation in Northeastern India?

Yashmita-Ulman[1] · Manoj Singh[2] · Awadhesh Kumar[3] · Madhubala Sharma[3]

Received: 28 December 2019 / Revised: 15 June 2020 / Accepted: 24 June 2020
© Zoological Society, Kolkata, India 2020

Abstract The degradation, fragmentation and isolation of tropical forests have led to the formation of small patches of human dominated landscapes interspersed with forest fragments. This affects the wildlife habitat and its population negatively. These human landscapes have been observed to have agroforestry systems as a dominant cropping practice in Assam, India. The present study was carried out in agroforestry systems (agri-silviculture systems, home gardens and tea gardens) to understand their role in the conservation of mammal species. Line transects and camera traps were used for recording mammal diversity. Altogether, 17 species of mammals belonging to 16 genera and 14 families were recorded in the selected agroforestry systems. The highest species richness was found in the home gardens (14) and the lowest was found in the agri-silviculture system (10). Home garden had the highest mammal encounter rate and relative abundance. Only five species of mammals were recorded through camera trapping. According to the IUCN Red List, 6% of mammal species recorded in the selected agroforestry systems were endangered or near threatened and 18% were vulnerable. The highest hunting trap encounter rate was found in tea garden (139 traps, 0.181 traps km^{-1}, 24 captures). Distance from forest was inversely proportional whereas hunting threat was directly proportional to mammal species richness. The only and strongest predictor of mammal species richness was hunting threat which accounted for 53.5% of variation in mammal species richness in the study area, implying that the agroforestry systems are capable of conserving species if hunting pressure is reduced. Therefore, promotion of alternative livelihood and formation of community conservation groups are needed to increase and protect the mammalian diversity in these agroforestry systems. Thus, agroforestry systems can act as a suitable habitat next to forests for the dwindling wildlife population.

Keywords Agri-silviculture · Home garden · Tea garden · Mammal diversity · Hunting threat

✉ Yashmita-Ulman
yashmita2018@gmail.com

[1] Department of Forestry, ANDUAT, Ayodhya, Uttar Pradesh, India

[2] Department of Zoology, Kalinga University, Raipur, Chhattisgarh, India

[3] Department of Forestry, North Eastern Regional Institute of Science and Technology (Deemed to be University), Nirjuli, Itanagar, Arunachal Pradesh 791109, India

Introduction

Agroforestry systems (practice of combining trees with agricultural crops) are known to contribute in wildlife conservation owing to their structure and vegetation composition. Schroth et al. (2004) identified three roles of agroforestry in biodiversity conservation namely, provision of alternative habitats for generalist species, reduction of primary forest conversion rates and conservation of wildlife populations by connecting isolated habitat remnants. The various types of agroforestry systems like live fences, riparian forests and shade-grown crops etc. have been known to provide habitats for animal species such as moths (Ricketts 2001), birds (Greenberg et al. 2000; Klein et al. 2003; Bos et al. 2007; Schroth and Harvey 2007), terrestrial mammals (Estrada et al. 1994) and bats (Estrada et al. 1993; Faria and Baumgarten 2007). Gallina et al. (1996) has studied the mammalian diversity in coffee agroforestry

Published online: 09 July 2020

ACTA ACUSTICA UNITED WITH ACUSTICA
Vol. 105 (2019) 294 – 300
DOI 10.3813/AAA.919312

Vocal Adjustments in Purple Sunbird (*Cinnyris asiaticus*) at Noisy Habitats

Manoj Singh[1], Akash Jaiswal[2], Yashmita Ulman[3], Krishan Kumar[4]
[1] Department of Zoology, Kalinga University, Raipur, India
[2] School of Life Sciences, Jawaharlal Nehru University, New Delhi, India
[3] Department of Forestry, Guru Ghasidas University, Bilaspur, India
[4] School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India.
krishan_kumar@mail.jnu.ac.in

Summary
This study examines the purple sunbirds' (*Cinnyris asiaticus*) vocalizations in different habitats to assess the vocal adjustments made by the bird to avoid masking of its acoustic signals in noisy conditions. Sampling of acoustic signals of purple sunbird at different sites was done at sites with varying background noise levels by simultaneously recording the audio samples as .wav files, and the corresponding sound pressure levels. We identified twelve different types of vocal signals in purple sunbird based on their morphological appearance in the spectrogram. Correlation analysis between background noise levels and spectral parameters of most of these signals showed weak and statistically non significant association between them. However, a statistically significant positive association was found between song amplitude and background noise levels. While our results support the presence of Lombard effect in purple sunbird vocalizations in noisy conditions, they do not seem to suggest any associated changes in spectral content in such conditions.
PACS no. 43.80.-n

1. Introduction

Globally expanding urban perimeters and fast developing transportation network have been associated with increasing anthropogenic noise [1]. It is now well known that increased noise levels in urban habitats may mask acoustic communication in many bird species, and can cause changes in their acoustic behavior [2, 3, 4, 5, 6]. Birds rely on acoustic communication for a variety of functions such as mate attraction, territory marking, predator alarm, begging for food, contact with neighbours, availability of food and for many other functions [7, 8, 9, 10]. Hence, their survival and reproductive success are adversely influenced by increase in the background noise which tends to mask bird vocalizations [11, 12, 13, 14].

Birds adjust their vocal behavior in different ways to overcome the negative effects of noise on signal communication. This includes shifting the vocalization temporally to quieter periods [15], increasing signal repetition [16], raising the amplitude i.e. Lombard effect [17, 18, 19, 20, 21] and altering the spectral content [22] of vocalization. Among these, the latter two strategies i.e. raising the amplitude and altering the spectral content have drawn considerable attention of researchers across the world.

Slabbekoorn and Peet (2003) reported frequency adjustment in great tits (*Parus major*) in the city of Leiden (The Netherlands) where individuals in territories with higher noise levels were found to sing songs at raised minimum frequencies [22]. Since then, this strategy of song frequency adjustment has been reported repeatedly in many other studies. For instance, similar frequency shift was also reported in other populations of great tits (*Parus major*) [5, 23, 24, 25], song sparrows (*Melospiza melodia*) [26], house finches (*Carpodacus mexicanus*) [27, 28], chiffchaffs (*Phylloscopus collybita*) [29], black-capped chickadees (*Poecile atricapillus*) [30]. Interestingly, many of these studies report that it is the minimum song frequency that is shifted upwards, presumably as a response to avoid signal masking by the low-frequency traffic noise.

However, Brumm and Zollinger (2011) argued that these studies did not measure the song amplitude and that such frequency changes may occur in association with Lombard effect as a byproduct [31]. They suggested that increase in the vocal frequency occurs involuntarily when the bird makes effort to be heard in noisy conditions by raising its amplitude. Such an increase in the vocal frequency coupled with the Lombard effect was reported in budgerigars [32], tinamous [33] and mallards [34], which are non-songbirds. However, other studies [35, 36, 37] reported the absence of such association between Lombard effect and frequency shift in songbirds. Dorado-Correa *et al.* (2018) suggest that songbirds might have developed the capacity to decouple the amplitude and frequency during the Lombard effect [34].

Received 1 August 2018,
accepted 22 January 2019.

© S. Hirzel Verlag · EAA

VOL. X, ISSUE XI, XIV, JULY 2020 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

87 86

ESTIMATION OF HETEROSIS AND ECONOMIC HETEROSIS FOR GROWTH, YIELD AND QUALITY IN TOMATO

Satish Yadav[1], G.C. Yadav[1], Vimlesh Kumar[2], Dheeraj Yadav[3] and Akhilesh Kumar Yadav[4]
[1]Department of Vegetable Science,
[1]Department of Horticulture,
[2]College of Agriculture, Campus Azamgarh,
[4]KVK, Azamgarh, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj Ayodhya-224229
vimleshkumaryadav@gmail.com

MS 2577 (MS Received 21.06.2020, MS Revised 26.07.2020, MS Accepted 27.07.2020)
(RESEARCH PAPER IN HORTICULTURE)

Abstract

The present study was conducted with aim to find out heterosis and economic heterosis for growth characters, marketable yield and quality attributes. The line × tester mating design was used for the seed production and the lines, testers and their offspring were evaluated for two consecutive years. The evaluation was conducted in randomized block design with three replications. The study revealed that the heterosis for marketable fruit yield per plant, over better parent ranged from -64.64 per cent to 32.36 per cent and the heterosis over standard variety ranged from -44.77 to 50.50 per cent and in Y_2 economic parent ranged from-60.57 per cent to 47.36 per cent and standard heterosis from-53.24 to 20.91 %. The significant and heterotic crosses common in both the seasons for fruit yield per plant were Azad T-6 × CO-3 and Azad T-6 × H-24 over better parent and Arka Abha × NDT-4 and NDT-5 × NDT-4 over standard check (economic parent). Based on the above findings it may be concluded that crosses Azad T-6 × CO-3 and Azad T-6 × H-24 which showed top heterosis over seasons, parents (better and standard) and also possessed attractive fruit shape as per market demand may be exploited as commercial hybrid in future.

Key words: *Tomato, line × tester, economic heterosis, quality*

Introduction

Tomato (*Solanum lycopersicon*(Mill.)**Wettsd.**),2n=24) of nightshade or solanaceae family with primary centre of origin in Mexico-Peru-Equador region was once considered inedible but has evolved into globally leading popular vegetable. It is highly worked crop by the horticulturists and breeders. It has wide range of variation in terms of growth habit, morphological traits and uses making it a repository of glowing traits in its armory. It has determinate vs indeterminate types, cherry to table type, canning to juice type, smooth to ridged, acidic to sweet type, red to orange yellow to striped colour fruits, etc., But whatever may be the type botanically it is same and they are crossable. Botanical nomenclature of tomato has seen a lot of debate, research work and change. It's nomenclature has changed from previously widely used *Lycopersicon esculentum* Miller in *Lycopersicon* genus to originally named *Solanum lycopersicum* L. in *Solanum* genus (named in 1753 by Linnaeus; *lyco* = wolf, *persicum* = peach *i.e.*, wolf-peach). Tomato ranks second in importance next to potato in many countries including India Bose and Som, 1993).

Development of hybrids with extreme earliness, quality, uniformity and adaptability to adverse conditions, is easily possible in tomato as it is self-pollinated crop. The information about various aspects of heterosis with its manifestation is very crucial for development of superior hybrid varieteis.The formulation of plant breeding strategy mainly depends on the support of genetic information provided by studies on inheritance and behaviour of major quantitative traits in which the breeder is interested. Among the several mating designs adopted for the study of genetic architecture in tomato, line x tester mating design (**Kempthorne,1957**) has been widely used for evaluation of more number of genotypes at a time for combining ability effects. This calls for continuous work in tomato improvement in terms of varietal or F_1 hybrid development, identification and management. Many institutions are working on these aspects at national level and are coming out with new genotypes. These new genotypes could be tested for suitability and adaptability in other regions besides using them for hybrid development or getting desirable segregants.

Materials and methods

The experiment was conducted on sandy loam soil, at the Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Faizabad (U.P.) Geographically, Kumarganj falls in the sub-tropical climate and is located in between 24.470 N latitude and 82.12.0 and 83.980 E longitude at an altitude of 113 m gangetic alluvial plains of Eastern Uttar Pradesh. The physical and chemical properties of the soil are good and average fertility level and pH in the range of 7.5 to 8.5. The experimental plant material for present investigation was comprised of 36 F1's developed by crossing nine lines (Arka Abha, Azad T-6, Arka Ahuti, Punjab Chhuhara, HS-7, Angoor Lata, NDT-5, NDT-3, and Arka Abhijeet) with four testers (CO-3, H-24, H-86 and NDT-4) during *rabi*, 2012-13. The experiment was conducted in Randomized Complete Block Design (RBD) with three replications to assess the performance of 36 F1 hybrids and 13 parents (9 lines and 4 testers). Observations were recorded for five randomly selected plants in each replication. Genotype means were used for the analysis of variance (Panse and Sukhatme, 1967). The combining ability analysis was carried out following Kempthorne (1957). Data were recorded on five randomly selected plants for characters under study.

The nature and magnitude of heterosis was worked out using information on various quantitative characters studied. Heterosis expressed as per cent increase or decrease of hybrids (F_1's) over better parent (heterobeltiosis) and standard variety (standard heterosis).

Heterobeltiosis

$$\text{Heterobeltiosis}(\%) = \frac{\overline{F_1} - \overline{BP}}{\overline{BP}} \times 100$$

Where,

$\overline{BP}$ = Mean value of the better parent

$$\text{S.E(d) for } \overline{F_1} - \overline{BP} = \sqrt{\frac{2MSE}{r}}$$

C.D. = S.E(d) × t (at error d.f.)

Standard heterosis

The variety H-86 of tomato involved in crosses was used as standard variety to calculate standard heterosis.

$$\text{Standard heterosis}(\%) = \frac{\overline{F_1} - \overline{SC}}{\overline{SC}} \times 100$$

Where,

REDMI NOTE 8 PRO
AI QUAD CAMERA

87

85

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(4): 1333-1336
© 2020 IJCS
Received: 06-05-2020
Accepted: 10-06-2020

Gaurav Singh
Department of Vegetable Science, A. N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

PK Singh
Department of Vegetable Science, A. N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, A. N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Angad Singh
Department of Fruit Science, Directorate of Extension, A.N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

VP Pandey
Department of Vegetable Science, A. N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Mayank Singh
Assistant Professor, Department of Agriculture Extension, U.P. College, Varanasi, Uttar Pradesh, India

Corresponding Author:
Gaurav Singh
Department of Vegetable Science, A. N. D.U.A. & T., Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on heritability in narrow sense and genetic advance in Tomato (*Solanum lycopersicum* L.) crops

Gaurav Singh, PK Singh, GC Yadav, Angad Singh, VP Pandey and Mayank Singh

DOI: https://doi.org/10.22271/chemi.2020.v8.i4l.9785

Abstract
The present investigation entitled "Studies on heritability in narrow sense and genetic advance in Tomato (*Solanum lycopersicum* L.) crop." was conducted during *Rabi* seasons of 2017-18 (E_1) and 2018-19 (E_2) heritability and genetic advance using diallel mating design at the Main Experiment Station (MES) of the Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India. Ten diverse parents of tomato were crossed in a diallel fashion (excluding reciprocals) for generating experimental material. All the Ten parents and their 45 hybrids were grown in Randomized Block design with three replications. Observations were recorded on the 16 characters *viz.*, Days to 50 per cent flowering, Days to first fruit harvest, Plant height (cm), Number of primary branches per plant, Number of fruits per cluster, Number of fruits per plant, Average fruit weight (g), Pericarp thickness (mm), Number of locules per fruit, Fruit length (cm), Fruit diameter (cm), Marketable fruit yield per plant (kg), Total fruit yield per plant (kg), Total soluble solids (%), Titrable acidity (%), Ascorbic acid content (mg/100 g fresh fruit).
High heritability (narrow sense) along with high genetic advance in per cent of mean were observed for most of the important economic traits showing ample scope of improvement.

Keywords: Tomato, heritability, genetic advance, yield

Introduction
Tomato (*Solanum lycopersicum* L.) is one of the most popular solanaceous vegetable crop, having chromosome number 2n=2x=24.Tomato universally treated as "Protective Food" is being extensively grown as annual plant all over the world. Tomato ranks second in importance next to potato in many countries including India (Bose and Som 1993) [3]. It is a highly worked crop by the horticulturists and breeders. Tomato is used as fresh as well as processed vegetable. It is also very important for processing industries as it ranks first as processing vegetable crop in the world. It is a very good source of income for small and marginal farmers. Ripe fruits are widely used for preparation of several items like paste, syrup, juice, ketchup, puree and drinks etc.
Fresh fruits of tomato are in great demand round the year throughout the country. Tomato is a rich source of vitamins, minerals and organic acid. There are various types of flavoring compounds found in the fruits, which enrich the taste. The hundred gram mature tomato fruits contains 94 g moisture, 3.6 g carbohydrates, 0.9 g protein, 0.2 g fat, 585 IU vitamin A, 48 mg calcium, 26 mg vitamin C & Vitamin B (Thiamine 0.12 mg and Riboflavin 0.06 mg) (Choudhary *et al.*, 2009) [4].
Tomato is an herbaceous sprawling plant growing up to 1-3 m in height with weak woody stem. The flowers are yellow in colour and the fruits of cultivated varieties vary in size from cherry tomatoes, about 1–2 cm in size to tomatoes, about 10 cm or more in diameter. Most cultivars produce red fruits when ripe. The plants have taproot system and two types of growth habit, determinate & indeterminate. Fruits bearing of different types. Determinate or bush types bear a full crop at once and top off at a specific height. They are often good choices for container growing and determinate types are preferred by commercial growers who wish to harvest a whole field at one time, or home growers which are interested in canning.

The Pharma Innovation Journal 2020; 9(9): 232-234
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(9): 232-234
© 2020 TPI
www.thepharmajournal.com
Received: 25-07-2020
Accepted: 28-08-2020

Sharvan Kumar
Ph.D. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VB Singh
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

VP Pandey
Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Sharvan Kumar
Ph.D. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on genetic variability, heritability and genetic advance for certain metric traits in fenugreek (*Trigonella foenum- garacum* L.)

Sharvan Kumar, VB Singh, VP Pandey, GC Yadav and CN Ram

Abstract
The present investigation entitled "Studies on genetic variability, heritability and genetic advance for certain metric traits in Fenugreek (*Trigonella foenum- garacum* L.) " was conducted during *Rabi* seasons of 2018-19 (E1) and 2019-20 (E2) heritability and genetic advance using diallel mating design (excluding reciprocal) at the Main Experiment Station (MES) of the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India. Ten diverse parents of fenugreek were crossed in a diallel fashion (excluding reciprocals) for generating experimental material. All the Ten parents and their 45 hybrids were grown in Randomized Block design with three replications. Observations were recorded on the 11 characters viz., Days to 50 per cent flowering, Days to maturity, Plant height (cm), Number of branches per plant, pod length (cm), Number of pods per plant, Number of seed per pods, Test weight (g), Biological yield (g), Harvest index (%) and yield per plant (g).
High heritability (broad sense) along with high genetic advance in per cent of mean were observed for most of the important economic traits showing ample scope of crop improvement by selection.

Keywords: Fenugreek, PCV, GCV, heritability, genetic advance, yield

Introduction
Fenugreek (*Trigonella foenum-graecum* L.) 2n=16, locally known as 'Methi' belongs to the family-*Leguminoaceae* and sub-family-*Papilionaceae*, along with it's another cultivated species *Trigonella corniculata* L.
Trigonella comes from Latin words 'little triangle'in reference to triangular shape of small yellowish white flowers. The spices epithet foenum-gracum means 'Greek hay' and according to Rosengarten, the Romans, who got the plant from Greece where it was a very common crop in ancient times, gave it this name it is also called 'ox horn' or goat horn because the two seeds pods projecting in opposite direction usually from the nodes of the stem base that resemble with ox or goat horns.
The wild form of fenugreek is found growing in North Western India, Argentina, Egypt, Southern France, Morocco, Spain, Turkey, China, Pakistan and Lebanon are the leading countries for fenugreek production.
India is one of the dominant producers and exporters of fenugreek. The value-added products of fenugreek such as its seeds, powder and oleoresins are exported to Europe, North America, South Africa and other Asian countries. In India, it occupies an area of about 218 thousand hectare with 220 mt annual productions with share of 2.4 per cent (Anonymous, 2017-18) [2]. Fenugreek is mainly grown in the states of Rajasthan, Gujarat, Punjab, Haryana, U.P., M.P. Maharashtra and Tamil Nadu. Rajasthan alone contributes nearly 60 per cent of total area and 80 per cent of total production of the crop in the country.
Phenotypic variability changes under different environmental conditions while genetic variability remains unchanged and more useful to a plant breeder for exploitation in selection or hybridization. Yield is very complex characteristics controlled by several yield contributing components and it is highly influenced by environmental factors, consequently estimates of heritability and genetic advance are useful for selection.

Material and methods
The present investigation entitled "Studies on genetic variability, heritability and genetic advance for certain metric traits in Fenugreek (*Trigonella foenum- garacum* L.)" was

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO
AI QUAD CAMERA

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(5): 761-767
© 2020 IJCS
Received: 13-07-2020
Accepted: 12-08-2020

Manjeet Kumar
Ph.D. Scholar, Department of Vegetable Science A. N. D. U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science A. N. D. U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science A. N. D. U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Sharvan Kumar
Ph.D. Scholar, Department of Vegetable Science A. N. D. U.A & T, Kumarganj, Ayodhya

Devraj Singh
Assistant Professor, CGC Technical Campus Jhanjheri, Mohali, Punjab, India

Corresponding Author:
Manjeet Kumar
Ph.D. Scholar, Department of Vegetable Science A. N. D. U.A & T, Kumarganj, Ayodhya, Uttar Pradesh, India

Study on gene action involved in inheritance of yield and its contributing traits in brinjal (*Solanum melongena* L.)

Manjeet Kumar, CN Ram, GC Yadav, Sharvan Kumar and Devraj Singh

DOI: https://doi.org/10.22271/chemi.2020.v8.i5k.10391

Abstract
The present investigation was carried out to evaluate the 45 F1 hybrids derived from half diallel fashion along with ten parents in randomized block design with three replications during Rabi season of 2018-19 (E_1) and 2019-20 (E_2) at the Main Experiment Station (MES) of the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). The genetic components of variation were determined for sixteen characters *viz*., days to 50 % flowering, leaf length (cm), leaf width, number of flower per inflorescence, days to first harvesting, plant height (cm), primary branches per plant, number of fruit per cluster, number of fruits per plant, average fruit weight (g), fruit length (cm), fruit circumference (cm), yield per plant (g), specific gravity, TSS (%) and dry weight/ 100g. The data were analyzed to fulfill the following objectives to estimates genes action for yield and its component traits analysis of variance revealed significant difference for the parents, F1 S and parent vs. F1s for all the characters indicating wide variation except fruit circumference in both years and fruit length inY1. Both additive and dominance variance were found important in the inheritance of most of the traits, whereas dominance showed over dominance for the most of the traits.

Keywords: *Solanum melongena*, genc action, yield parameters, diallel

Introduction

Brinjal belongs to the family Solanaceous and botanically known as *Solanum melongena* L. The family contains 75 genera and over 2000 species, out of which, about 150-200 are tuber bearing and belong to section Tuberarium. The majority of species (about 1800) are non-tuber bearing. Cytological studies have indicated that chromosome number 2n = 24 is same in almost all species. There are 3 main botanical varieties under the species melongena **(Choudhury, 1976a)**. The common brinjal, to which large, round or egg-shaped fruited forms belong, are grouped under var. *esculentum*. The long, slender types are included under var. *serpentinum* and the dwarf brinjal plants are put under var. *depressum*. Brinjal is considered a native to India where the major domestication of large fruited cultivars occurred. In "Origin of cultivated plants" published in **1886 De Candolle**, stated that the species *S. melongena* has been known in India from ancient times and regarded it as a native of Asia. Vavilov (1928) was of the opinion that its center of origin was in the Indo-Burma region.

In brinjal, heterostyly is a common feature. Four types of flowers have been reported depending on the length of styles, viz. (i) long-styled with large ovary, (ii) medium-styled with medium size ovary, (iii) Pseudo short-styled with rudimentary ovary and (iv) true short-styled with very rudimentary ovary (Krishnamurthi and Subramaniam, 1954).

The de cholestrolizing action is attributed to the presence of polyunsaturated fatty acid (linoleic and linolenic) which are present in flesh and seed of the fruit in higher amount (65.1%). In addition, variation is also noticed for characters like vegetative growth, maturity and presence or absence of spines on leaves, stem and fruit calyx among the indigenous material. Among the various mating designs diallel cross techniques has been most frequently used to determine nature and magnitude of gene action through the estimate of genetic components, general and specific combining ability variances and their effects in many self, often-cross and cross-pollinated crops. In brinjal several workers have used this design for estimating component of variation and combining ability (Bavage *et al*., 2005; Panda *et al*.,

REDMI NOTE 8 PRO
AI QUAD CAMERA

88

The Pharma Innovation Journal 2020; 9(9): 300-303
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; 9(9): 300-303
© 2020 TPI
www.thepharmajournal.com
Received: 18-07-2020
Accepted: 22-08-2020

Manjeet Kumar
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sharvan Kumar
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Rohit Kumar Bajpai
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Manjeet Kumar
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on genetic variability, heritability in narrow sense and genetic advance in percent of mean in brinjal (*Solanum melongena* L.)

Manjeet Kumar, CN Ram, GC Yadav, Sharvan Kumar and Rohit Kumar Bajpai

Abstract
The present investigation entiled "Studies on genetic variability, heritability in narrow sense and genetic advance in percent of mean in brinjal (*Solanum melongena* L.)" was conducted -during *Rabi* season of 2018-19 (E1 and 2019-20 (E2) heritability and genetic advance using diallel mating design (excluding reciprocal) at the Main Experiment Station (MES) of the Department of Vegetable Science, Acharya Narendra Deva University of agriculture & Technology, Narendra nagar, Kumarganj, Ayodhya (U.P.) India. Ten diverse parents of brinjal ware crossed in a diallel fusion (excluding reciprocals) for generating experimental material. All the Ten parents and their 45 hybrids ware grown in randomized block design with three replications. Observation were recorded on the 16 characters *viz*., days to 50% flowering, leaf length (cm), leaf width, number of flower per inflorescence, days to first harvesting, plant height (cm), primary branches per plant, number of fruit per cluster, number of fruits per plant, average fruit weight (g), fruit length (cm), fruit circumference (cm), yield per plant (g), specific gravity, TSS (%) and dry weight/ 100g.
High heritability (broad sense) along with high genetic advance in per cent of mean were observed for most of important economic traits showing ample scope of crop improvement by selection.

Keywords: Brinjal, heritability, genetic advance, yield

Introduction
Eggplant or brinjal (*Solanum melongena* L. 2n=2x= 24) is a solanaceous vegetable, which is known by various name in India *viz*., Baigan (Hindi) and worldwide known as Aubergine (France) or Guinea squash, is one of the most popular and major vegetable crop in India and other parts of the world. It is an often-pollinated and annual herbaceous crop, originated in India and shows secondary diversity in South East Asia. It is being grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, France, Italy and U.S.A. Brinjal has got much potential as raw material in pickle making and dehydration industries. It is highly productive and usually finds its place as the poor man's vegetable. In India, it is being consumed as a cooked vegetable in many ways and also liked by both poor and rich. Availability round the year, easy culture, moderate to high yield and consumption in varieties of ways like salad, bhaji, stuffed brinjal, bhartha, pickles etc., has made brinjal the king of vegetable in India. Further, in recent years, brinjal is being exported in the form of product like Baigan bhartha, pickles etc. to Middle East countries. Brinjal belongs to the family Solanaceae and botanically known as *Solanum melongena* L. The family contains 75 genera and over 2000 species, out of which, about 150-200 are tuber bearing and belong to section Tuberarium. The majority of species (about 1800) are non-tuber bearing. Cytological studies have indicated that chromosome number 2n = 24 is same in almost all species. There are 3 main botanical varieties under the species melongena (Choudhury, 2014) [3]. The common brinjal, to which large, round or egg-shaped fruited forms belong, are grouped under var. *esculentum*. The long, slender types are included under var. *serpentinum* and the dwarf brinjal plants are put under var. *depressum*.
Brinjal is considered a native to India where the major domestication of large fruited cultivars occurred. In "Origin of cultivated plants" published in 1886 De Candolle, stated that the species *S. melongena* has been known in India from ancient times and regarded it as a native of Asia. Vavilov (1928) was of the opinion that its center of origin was in the Indo-Burma region. Globally, India ranked second in vegetable production and contributed 15.8 and 14% to global

ESTIMATION OF DIRECT AND INDIRECT YIELD CONTRIBUTING TRAITS IN EGG PLANT (*SOLANUM MELONGENA* L.)

Sandeep Kumar Gupta[1], G. C. Yadav*[2], C. N. Ram[2], Manjeet Kumar[1] and S.K Verma[3]
1 Students, 2 Associate professor, Department of Vegetable Science,
3. Senior Scientist and Head KVK Bahraich
Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya

Abstract

The present investigation was executed at Main Experiment, Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya, during *Kharif* 2012, with objectives to find out the direct and indirect effect of yield components on yield by path coefficient analysis. Experimental material for the study was consisted of 46 genotypes of brinjal pertaining to four groups including five checks (Arka Nidhi, NDB-2, SM-6-6 Pant Rituraj and KS-224). The experiment was conducted in Randomized Complete Block Design with three replications. Each treatment consisted of 20 plants in two rows, having spacing of 45 cm between row to row and 45 cm plant to plant with net plot size of 4.5x1.2m^2. Observations were recorded on 11 quantitative characters *viz*., days to 50% flowering, primary branches per plant, plant height (cm), fruit weight (g), fruit circumference (cm), flowers per inflorescence, fruit length (cm), fruits per plant, marketable fruit yield per plant (kg), unmarketable fruit yield per plant (kg) and total fruit yield per plant (kg).The analysis of variance for the experiment indicated highly significant differences among the genotypes for all the traits. High magnitude of positive direct effect on yield was exerted by marketable fruit yield per plant followed by fruits per plant and fruit weight. The negative direct effects were showed by days to 50% flowering, fruit length, flowers per inflorescence and plant height but were substantially low. Marketable fruit yield per plant was found to have substantial positive in direct effect for fruit weight, fruit circumference and fruits per plant and negative effect for days to 50% flowering, towards total fruit yield per plant towards total fruit yield per plant.

Key Woords- Brinjal or egg plant (*Solanum melongena* L.) and path analysis

Introduction

Brinjal or egg plant (*Solanum melongena* L.) is one of the most important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. It is worldwide known as aubergine or guinea squash which is one of the most popular and major vegetable crop in India and other parts of the world. It is probably originated in India and showed secondary diversity in South East Asia. It is being grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, France, Italy and U.S.A. In Southern Europe, brinjal is a staple vegetable and it is a favourite dish in South East of France. Brinjal has got much potential as raw material in pickle making and dehydration industries. It is highly productive and usually finds its place as the poorman's vegetable. In India, it is being consumed as a cooked vegetable in many ways and is liked by both poor and rich. Year round availability, easy culture, moderate to high yield and consumption in varieties of ways like salad, bhaji, stuffed brinjal, bhartha, chatni, pickles etc., has made brinjal the king of vegetables in India. Further, in recent years brinjal is being exported in the form of products like *baingan bhartha, chatni, pickles* etc. to Middle East countries.

Brinjal contain certain medicinal properties like white brinjal is said to be good for diabetic patients (Choudhary, 1976). It can cure toothache if fried egg plant fruit in til oil is taken (Chen and Li, 1996). It has also been recommended as an excellent remedy for those suffering from liver complaint. One hundred gram edible portion of brinjal fruit contains 92.7% moisture, 24.0% calories, 4.0% carbohydrates, 1.4 g protein, 0.3 g fats, 1.3 g fibres, 124.0 (I.U.) Vitamin A and 12.0 mg Vitamin C (Chen and Li, 1996). It also contains 52.0 mg chlorine, 47.0 mg Phosphorus, 44.0 mg sulphur and other minerals (Aykroyd, 1963).

Brinjal being most important to growers and consumer, there is pressing need to increase its productivity to fulfill the increasing demands throughout the year. Estimation of correlation co-efficient among the yield contributing characters is necessary to understand the direction of selection and maximize yield in the shortest period. Path co-efficient provides an effective means of entangling direct and indirect causes of association of selection and measures the relative importance of each causal factor.

Keeping in view of the above theme, the present investigation was under taken during autumn - winter season 2012, with the following objectives to find out the direct and indirect effect of yield components on yield by path co-efficient analysis.

Materials and Methods

The experiment was conducted in Randomized Complete Block Design with three replications at MES, department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (UP) India during autumn-winter season 2012 to assess the performance of 46 genotypes of brinjal. Each treatment consisted of two rows. Ten plants were maintained in each row and replicated thrice. Transplanting was done at a spacing of 45 cm between row to row and 45 cm plant to plant having net plot size of 4.5x1.2 m^2.The seed were sown in nursery bed on 03-08-2012 and transplanted on 08-09-2012. All the recommended agronomic package of practices and plant protection measures were followed to raise a good crop. The analysis of variances was worked out by the methods suggested by Panse and Sukhatme (1967) and correlation coefficients as per method suggested by Dewey and Lu (1959).

Results and Discussion

The analysis of variance for different characters is presented in Table 1. The mean squares due to genotypes were highly significant for all the characters. In other words, the performances of the genotypes with respect of these characters were statistically different; suggesting that there exists ample scope for selection in different traits for further improvement.

Path coefficient is simply standardized partial regression coefficient which splits the correlation coefficient in to the measures of the direct and indirect effects of a set of independent variables on the dependent variable. This analysis provides a method for separating out direct and indirect effect of causal factors which affect the yield. The present study on path coefficient analysis revealed that the highest magnitude of positive direct affect on yield per plant was exerted by marketable fruit yield per plant followed by fruits per plant and fruit weight at both phenotypic and genotypic level (Table 2 and 3). This indicated that direct selection based on marketable fruit yield per plant and fruit weight would result in an appreciable improvement of yield per plant. The negative direct effect on yield was shown by days to 50% flowering (-0.057) Polar length of fruit (-0.038), flowers per inflorescence (-0.026), and plant height (-0.005) but were substantially low. Marketable fruit yield per plant was not only found to have maximum direct effect on total fruit yield per plant but it also contributed substantial positive indirect effect for fruit weight (0.3) followed fruit circumference (0.385) and fruits per plant (0.3) and negative indirect effect for days to 50% flowering (-0.178), towards total fruit yield per plant. Therefore during selection these characters should also be taken into consideration. Similar results had also been reported by (Naliyadhara *et al*., 2007; Mishra *et al*., 2007; Bara

REDMI NOTE 8 PRO
AI QUAD CAMERA

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(5): 768-773
© 2020 IJCS
Received: 24-05-2020
Accepted: 27-08-2020

Rohit Kumar Bajpai
Department of Vegetable Science, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

DP Mishra
Department of Vegetable Science, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

Vimlesh Kumar
College of Agriculture Campus Azamgarh, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

Sharvan Kumar
Department of Vegetable Science, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Rohit Kumar Bajpai
Department of Vegetable Science, A. N.D.U. A & T. Kumarganj, Faizabad, Uttar Pradesh, India

Evaluation of F_1 hybrids and parental lines for quantitative and qualitative traits of Brinjal

Rohit Kumar Bajpai, DP Mishra, GC Yadav, Vimlesh Kumar and Sharvan Kumar

DOI: https://doi.org/10.22271/chemi.2020.v8.i5k.10392

Abstract
The present investigation was conducted to know the diversity among the F1 hybrids developed through diallel mating design with the using 8 diverse parents for quantitative and qualitative traits. The study was conducted with the field evaluation of 28 F_1 hybrids and 8 parents during two consecutive years. The wide range of variation observed among the traits during both the years. Perusal of *per se* performance of the parental lines and F_1 hybrids (Table 4.2) for all the traits studied revealed a wide range of mean values which indicated that the parental lines involved in this study were genetically diverse and had good breeding value, which confirmed the predictions of analysis of variance. Out of 28 F_1 hybrids sixteen hybrids *viz*., $P_1 \times P_2$, $P_1 \times P_4$, $P_1 \times P_6$, $P_1 \times P_7$, $P_1 \times P_8$, $P_2 \times P_3$, $P_2 \times P_4$, $P_2 \times P_5$, $P_2 \times P_6$, $P_3 \times P_5$, $P_3 \times P_6$, $P_4 \times P_5$, $P_4 \times P_6$, $P_5 \times P_6$, $P_5 \times P_7$, $P_5 \times P_8$, $P_6 \times P_8$, and $P_7 \times P_8$ produced significantly higher yield than both standard varieties Punjab Sadabahar and Pant Rituraj.

Keywords: brinjal, fruit yield, diallel mating, quality traits

Introduction
Eggplant (*Solanum melongena* L.) or brinjal is a vegetable of family solanaceous, which is worldwide known as aubergine or guinea squash. It is one of the most popular and major vegetable crop in India and other parts of the world. It is self pollinated and annual herbaceous plant, probably originated in India and shows secondary diversity in South East Asia. It is being grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, France, Italy and U.S.A. In Southern Europe. Brinjal is a staple vegetable and it is a favourite dish in South East of France. Brinjal has got much potential as raw material in pickle making and dehydration industries (Singh *et al*., 1963) [9]. It is highly productive and being consumed as a cooked vegetable in many ways and liked by both poor and rich. Year round availability, easy culture, moderate to high yield and consumption in varieties of ways like salad, bhaji, stuffed brinjal, bhartha, chatni, pickles etc., is the king of vegetables in India. Further, in recent years brinjal is being exported in the form of products like *baingan bhartha, chatni, pickles* etc. to Middle East countries.

Eggplant is being cultivated in India over an area of 0.735 million ha with an average annual production of 12.95 million tonnes and productivity of 19.1 mt/ha. In Uttar Pradesh, brinjal is being cultivated on an area of 3.0 lakh ha with annual production of 90.9 lakh tonnes. Agra, Meerut, Lucknow, Kanpur, Aligarh, Chitrakoot and Gorakhpur districts contribute more area and production to the state pool (Anon., 2019) [2].

Brinjal fruits are rich source of minerals like calcium, magnesium, potassium, iron, zinc and copper. It is also a fair source of fatty acids and it is used for medicinal purposes in curing diabetes, asthma, cholera, bronchitis and diarrhea. It is reported to stimulate the intrapeptic metabolism of blood cholesterol. Leaf and fruit, fresh or dry produce marked drop in blood cholesterol level. The de-cholestrolizing action is attributed to the presence of polyunsaturated fatty acids (lionleic and linolenic) which are present in flesh and seeds of the fruit in higher amount (65.1%).

Materials and Methods
The experimental materials for the present study comprised of eight promising and diverse pure lines/varieties of brinjal selected on the basis of genetic variability from the germplasm

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO
AI QUAD CAMERA

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

GENETIC DIVERGENCE STUDY IN VEGETABLE PEA (*PISUM SATIVUM* L. VAR. *HORTENSE*)

Maneesh Pandey[1*], V. B. Singh,[2] G. C. Yadav[3], C. N. Ram and Nishakant Maurya[1]
1-students, 2 Professor and 3 Associate Professor
Department of Vegetable Science
NDUA&T, Kumarganj Ayodhya-224229

Abstract

The present investigation was conducted using thirty six genotypes of vegetable pea. Genetic divergence analysis following Mah... D^2 statistics revealed wide range of genetic diversity among thirty six genotypes of vegetable pea for all the fifteen characters u... pertaining to growth, yield and quality traits. The study observed for node at which first flower appears, days to 50 % flowering, ... nodes per plant, internodal length (cm), primary branches per plnat, plant height (cm), length of green pod (cm), width of pod, (cm)... of green pods per plant, number of green pods per cluster, number of seeds per pod, shelling per cent, green pod weight (g), T.S.S.... seed, green pod yield per plant(g). Genetic variation within and between clusters observed. Seven clusters were framed from the D... using Tocher method. Cluster II had highest number of genotypes (18) followed by cluster I (13), Cluster III (1), cluster IV (1) cl... clusterVI (1) and cluster VII (1).

Keywords: Vegetable Pea, Clusters, genetic divergence, germplasm

Introduction

Vegetable pea (*Pisum sativum* L. *var. hortense*) belongs to family Leguminoceae sub family Fabaceae. Pea is an important legume vegetable, extensively cultivated in the temperate regions and restricted to cooler altitudes in the tropics and winter season in the sub tropics. It is a self pollinated crop having diploid chromosome number 2n=2x=14. It is highly nutritious and capable of using atmospheric nitrogen. India ranks third in area after China and USSR under pea cultivation. The total area covered by peas is 4, 33600 hectare with the production of 38, 63600 metric tones with productivity of 8.9 metric tones per hectare **Anonymous, (2013).**

The major growing states of vegetable pea in India are Uttar Pradesh, Madhya Pradesh and Maharashtra. Uttar Pradesh is the leading producer of vegetable pea having alone about 50% of its area and production. It is also grown as summer season crop in the hilly states of India. The major area under vegetable pea cultivation is under mid season because of its suitability in various agro-climatic zones. Large proportion of vegetable pea are processed (canned, frozen and dehydrated and pickle) for consumption. It is mostly consumed as green fresh grains for vegetable purpose. Vegetable pea being most important to growers and consumer, there is pressing need to increase its productivity to fulfil the increasing demands throughout the year. The information usually needed for developing high yield varieties in a particular species pertains to the extent of genetic variability for desirable traits in the available germplasm. Evaluation of germplasm is the basic tool for identification of important genotypes. Mahalanobis D^2 analysis helps in the assessment of genetic diversity among the genotypes and the contribution of each character to the total diversity. Greater the genetic distance better the chance of obtaining desirable hybrids or segregates after hybridization between diverse groups of entries.

Materials and Methods

The experimental material for the present investigation comprised of 36 genotypes of vegetable pea collected from different places in India and being maintained at Main Experiment Station in the Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). The experiment was conducted in Randomized Complete Block Design with three replications during *Rabi* season in 2013-14 to assess the performance of 36 vegetable genotypes including 3 Check verities. Each genotype consisted of five rows and replicated thrice. Each entry was grown in the plot size of and 3 m x 1.5 m. The line sowing was done with the spacing of 30 cm and 10 cm from seed to seed. The seeds were shown on 23 October 2013. All the recommended agronomic package of practices and plant protection measures were followed to raise a healthy crop. Observations were recorded on randomly selected five plants from each genotype in each replication. Observations were recorded on five randomly selected plants from each treatment in each replication for the following characters, .(i) nodes at which first flower appears, (ii) days to 50% flowering, (iii) number of node per plant (iv) ... length, (v) primary branches per plant, (vi) plant height, (vii) ... pod, (viii) width of pod, (ix) number of green pods per cluster, (xi) number of seeds per ... number of green pods per plant, shelling percent (xiii) pod weight (xiv) TSS of edible seeds ... yield per plant.

Results and Discussion

The studies on genetic divergence among thirty six genot... vegetable pea were carried out by using Manalanobis D^2 statist... present investigation 36 genotypes of vegetable pea were gro... seven distinct non- over lapping clusters. This indicated presen... considerable diversity in the genotypes. The major clusters ... above mentioned genetic divergence analysis contained frequen... genotypes of heterogeneous origin. Although the genotypes of ... origin or geographic region were also found to be grouped toget... the same cluster. The instances of grouping of genotypes of dif... origin or geographic region in same cluster were frequently obse... This suggested that there is no parallelism between genetic ... geographic diversity. Cluster II had maximum number of geno... (18) followed by clusters I (13), while cluster III, IV, V, VI and ... each with one genotypes. The intra cluster D^2 values ranged from ... (cluster III and VII) to 4.94 (cluster II). The maximum inter cl... distance was observed between cluster I and cluster IV (10.86) w... suggested that members of these two clusters are genetically ... diverse to each other. The inter clusters distance between cluste... and cluster VII (10.62), cluster III to IV (9.17), cluster I to II (8.... and cluster V to VII (8.56) were very high. The minimum inter clu... D^2 value was recorded in case of cluster II and cluster IV (6.32). T... higher inter cluster distance indicated greater genetic diverge... between the genotypes of these clusters, while lower inter clu... values between the cluster suggested that the genotypes of the cluste... were not much genetically diverse from each other. Similar findi... were also reported by Sing and Mishra (2008), Cupic *et al* (2011) a... Srivastava et al (2012). A perusal of **Table 3** showed that clust... means for different traits indicated considerable differences betwe... the clusters. Cluster I and II showed maximum mean value for plan... height (98.35 and 69.53) followed by pod yield per plant (54.89 an... 47.76) and shelling percentage (45.49 and 45.38), respectiv... Maximum mean Value in Cluster III was found for plant heig... (114.40) followed by days to 50 % flowering (51.67) and pod yi... per plant (46.16).Cluster IV showed maximum mean value for pla... height (49.47), shelling percentage (46.67) and days to 50 % flower... (44.33). Cluster V showed maximum mean value for plant heig... (66.33cm), pod yield per plant (52.36) and days to 50 % flower... (41.0). Cluster VI showed maximum mean value for plant heig... (61.00), pod yield per plant (56.17) and days to 50 % flower... (50.67). Cluster VII showed minimum mean values for plant heig... (84.47), days to 50 % flowering (60.67) and shelling percenta... (35.33).

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDIES ON COMBINING ABILITY IN TOMATO (*SOLANUM LY COPERSICUM* (MILL.) WETTSD.)

Pravendra Kumar[1], P. K. Singh[2], G. C. Yadav*[3], C. N. Ram[3], Satish Yadav[1] and S.K Verma[4]
1 Students, 2 Professor 3 Associate professor
Department of Vegetable Science,
4, Senior Scientist and Head KVK Bahraich
N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.), India.

Abstract

Eight diverse varieties of tomato were crossed in a half diallel fashion for generating experimental material grown at Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P) India, during *Rabi* season 2012-2013. All the 36 genotypes were grown in Randomized Block Design with three replications. The mean squares due to general combining ability (GCA) and specific combining ability (SCA) were highly significant for all traits studied, except for days to 50 per cent flowering only due to parents *vs* hybrids. On the basis of GCA effects and *per se* performance parents Narendra Tomato 7 followed by Narendra Tomato 4 and Narendra Tomato 5 were found as the best general combiners for fruit yield per plant along with some other traits. In general, the parents, which have best *per se* performance, were also best general combiners, indicating a positive association between these two parameters. Specific combining ability effects of crosses revealed that eleven crosses showed highly significant SCA effects for fruit yield as well as number of fruits per plant. The cross Narendra Tomato 6 x Narendra Tomato 8 were the best specific combiner fruit yield, and fruit weight. The cross Narendra Tomato 4 x Narendra Tomato 7 was the best specific combiner for total soluble solid and fruit circumference. While the cross Narendra Tomato 1 x Narendra Tomato 6 was the specific combiner for days to 50 per cent flowering.

Key Words: Tomato (*Solanum lycopersicum*, general and specific combining ability

Introduction

Tomato (*Solanum lycopersicum* (Mill.) Wettsd.) is the most widely grown vegetable of the World. India is the second largest tomato producer of the world after China, accounting for about 11% of the world tomato production (Indian Horticulture Database, 2011). Tomato is universally treated as 'Protective Food' since it is a rich source of minerals, vitamins, antioxidants and organic acids. The nutrition importance of the tomato indicates there is need to formulate breeding programme and to develop cultivars rich in lycopene, processing traits with high quality of fruit as well as yield. Recent studies indicated that lycopene that give the ripe tomato its bright red colour, is a very effective natural antioxidant and quencher of free radicals (Simon, 1992). Lycopene is especially efficient in neutralizing Reactive Oxygen Species (ROS). These properties of lycopene are due to its unique chemical structure, a very long chain of conjugated double bonds. Efforts are being made to increase its productivity by developing superior varieties. The entire genetic variability observed in the analysis for each trait was partitioned into its components, *i.e.* GCA and SCA as defined by Sprague (1966) and reciprocal effects as sketched by Griffing (1956). They stated that GCA effects were due to additive type of gene action and SCA effects were due to non-additive (dominant or epistatic) gene action.

Combining ability studies are more reliable as they provide useful information for the selection of parents in terms of performance of the hybrids and elucidate the nature and magnitude of various types of gene actions involved in the expression of quantitative traits. Diallel cross analysis provides the estimates of genetic parameters regarding combining ability as well as a

rapid overall picture of the dominance relationship of the parents studied using the first filial generations (F1) with or without reciprocals.

Application of diallel technique in a self-pollinated crop like tomato for this purpose may be appropriate (Griffing, 1956). Hence the study was undertaken to estimate the combining ability in terms of specific and general combing ability in the present work.

Materials and Methods

Present investigation was conducted at the Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.), India; during *Rabi* 2012-2013. The experiment was conducted using eight diverse parents of tomato which were crossed in a diallel fashion (excluding reciprocal) and obtained twenty eight F_1 of tomato. Seeds were sown in nursery bed on 08th October 2012 and 30 days old healthy seedlings were transplanted in the experimental field on 08th November. 2012 in two row of 4 m length with inter and intra row spacing of 60 and 50 cm, respectively. Two check varieties (NDT-4 Indeterminate type, NDT-7) and 28 hybrids were planted in the field, keeping 8 plants in each row. The 36 genotypes were planted in Randomized Block Design with three replications. All recommended cultural practices were followed to raise good crop stand. Data were recorded for eleven characters *viz.*, days to 50 per cent flowering, plant height (cm), number of primary branches per plant, number of fruits per plant, average fruit weight (g), fruit circumference (cm), pericarp thickness (mm), number of locules per plant, total soluble solid (TSS), fruit length (cm) and fruit yield per plant (kg). The data were analyzed as per methods suggested for combining ability by Griffing (1956).

Results and Discussion

Highly significant variances were observed both for general and specific combining ability for all eleven characters studied (Table-1) . Highly significant gca and sca variance revealed that both additive and non-additive gene action were important in expression of all the traits on the study. Thus, both selection and heterosis breeding methods, respectively might be advantageous for effective utilization of additive and non-additive genetic variance for improvement of these traits. Similar findings had also been reported by Weerasinghe *et. al.* (2004) and Thakur and Joshi (2000).

The information regarding general combining ability (gca) effects of the parents is of prime importance as it helps in successful prediction of genetic potential of crosses. Perusal of gca effects of the parents as presented in Table- 2 and ranking of desirable parents on the basis of estimate of gca effect for eleven characters revealed that it is difficult pick-up a single good combiner for all the characters. However, parental line P_3, P_4, P_8, and P_7 having significant and negative gca effects for days to 50 per cent flowering and parents P_1, P_2 and P_5 showed significant positive gca effects for number of fruits per plant. Thus, these two parents P_3 and P_4, (NDT-3 and NDT-4) appeared to be good general combiner for early flowering while parents P_1, P_2 and P_5 were found good general combiner for fruit yield per plant. While NDT-7 and NDT-4 exhibited good general combining ability for number of fruits per plant (Table-2). This result may be due to low performance of parents P_1, P_2, P_3, P_6, and P_8 for yield per plant. In an attempt to identify most desirable parents based on gca effect as well *per se* performance the three best parents were considered for each traits. This indicated a positive association between the two parameters (gca effect and *per se* performance). Thus, parents P_3 was identify as the best general combiner for earliness, fruits yield per plant, average fruit weight and number of branches per plant. Similar correspondence between these two parameters was observed by Joshi and Kohli (2006) and Mahendrakar *et al.* (2005) in tomato.

Physiological Disorders in Fruit Crops

Anupam Singh[1] Pradip Kumar Saini[2] R. K. Yadav[3] Gulab Chand Yadav[4] Sunil Kumar[5]
[1,5]Department of Agriculture [2,3]Department of Crop Physiology [4]Department of Vegetable Science
[1,5]Integral University, Lucknow, Uttar Pradesh, India
[2,3,4]Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Abstract— Physiological disorders mainly affect deciduous tree fruits, such as apples, pears and most citrus fruits. Most of these disorders affect discrete areas of tissue, whether the produce be fruits. Thus, physiological disorder may be defined as the abnormal growth pattern or abnormal external or internal conditions of fruits caused by adverse environmental conditions (such as deviation from normal state of temperature, light, moisture, nutrient, harmful gases and inadequate supply of growth regulators).
Key words: Fruit Crop, Physiological Disorder

I. PAPAYA

Fig. 1: Papaya

A. Skin Freckles

1) Causes

The cause and factors that influence this disorder are unknown. Freckle-like blemishes occurred on ripe papaya fruits (cv. Sunset). Young fruits (less than 40 days old) were free from freckle. The freckle diameter increase during the last phase of fruit growth as the fruits approached the maturity. More freckle were seen on the exposed side of the fruit away from the stem.

2) Treatment

Wrapping young fruits in white paper bags significantly reduced freckle incidence.

B. Malformed Fruits

1) Causes

This melody is due to boron deficiency and it is one of the serious disorders limiting yield in papaya. It results in malformed fruits.

2) Treatment

-Spraying of boric acid 0.1% at 3 months interval from sixth month after planting onwards correct the deficiency.

II. GUAVA

Fig. 2: Guava

A. Bronzing

1) Causes

Bronzing of guava has been observed in places having low soil fertility and low pH. Affected plants show purple to red specks scattered all over the leaves. Under aggravated condition, total defoliation and fruits characterized with brown coloured patterns on the skin, with reduced yield are noticed.

2) Treatment

- Foliar application 0.5 % diammonium phosphate and zinc sulphatein combination at weekly intervals for two months reduced the bronzing in guava.
- Pre-fowering spray with 0.4 % boric acid and 0.3 % zinc sulphate increase the yield and fruit size.
- Spraying of copper sulphate at 0.2 to 0.4 % also increase the growth and yield of guava.

III. PINEAPPLE

Fig. 3: Pineapple

A. Multiple Crowns

1) Causes

Ordinarily fruit bears a single crown but in some cases fruit bears more than one. Consequently the top of the fruit will be flat and broad and fruit will be unfit for canning. Such fruits taste insipid and are corky. It is supposed to be a heritable character, found mostly in Cayenne group to which the variety Kew belongs.

B. Fruit & Crown Fasciation

1) Causes

Fasciated fruits are deformed to such an extent that they are totally useless. In certain cases, proliferation is so extreme that fruit is highly flattened and twisted with innumerable crowns. Fruits and crowns fasciation is associated with high vigour of plants, which take longer time to flower. High fertility of soil, warm weather and calcium r zinc deficiency may favour fasciation.

C. Collar of Slips

1) Causes

The collar of slips is typified by the presence of a large number of slips arising from stem close to the base of the fruit, or even

All rights reserved by www.ijsrd.com

REDMI NOTE 8 PRO
AI QUAD CAMERA

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSB NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SCREENING OF POTATO (*SOLANUM TUBEROSUM* L.) VARIETIES/HYBRIDS FOR THEIR ROTTING PERCENTAGE DURING STORAGE UNDER AMBIENT CONDITIONS

Satish Kumar*, G.C. Yadav, C.N. Ram, Nishakant Maurya and Surendra Kumar Verma
Department of Vegetable Science,
N.D. University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) 224 229

Abstract

The experiment was conducted with thirty six varieties/hybrids replicated thrice in Complete Randomized Block Design (CRD) during the summer of 2007 at the Laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The small gunny bags of 5 kg capacity were kept for 120 days at ambient storage condition. Physiological losses due to rotting (by number and weight) was increases continuously in all the treatments from 90 to 120 days of storage period under ambient conditions. Hybrids J/95-242 and B-420(2) showed minimum rotting of tubers at 90 and 120 days under ambient storage conditions.

Key words: Variety/hybrids, Rotting, Potato, post-harvest, ambient condition.

Introduction

The potato (*Solanum tuberosum* L.) is one of the most efficient horticultural food crops. It belongs to family Solanaceae, which constitutes around 85 genera with 2200 species and Solanum is the largest genus with 1700 species. Among major potato growing countries, India ranks third after China and Russian Federation. The present area under potato in India is about 2.117 million hectares with production and productivity of 43.417 million tones and 20.50 t/ha (Anonymous, 2016) respectively.

The potato is an easily grown plant that produces more food on less land. One hectare of potatoes can yield food value of 2-4 hectares of grain. The dry matter production in potato is 47.6 kg/ha/day, whereas in wheat and rice it is 18.1 and 12.4 kg/ha/day, respectively. Storage studies in potatoes stored at higher temperatures have been conducted by different workers but information are insufficient for specific location. Therefore, information on identification of varieties/hybrids with good shelf-life will be desirable for a few months for domestic and processing purposes.

Materials and Methods

The present investigation was carried out in the laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya (U.P.) during March to June, 2007. The experimental material comprised of thirty-six varieties/hybrids of potato and were evaluated in Completely Randomized Design with three replications. The recorded data in Complete Randomized Design (CRD) was analyzed statistically by the method suggested by Cochran and Cox (1963).

Results and Discussion

Studies on changes during ambient storage of different varieties/hybrids of potato revealed that physiological loss due to rotting increases continuously in all the varieties/hybrids from 30th to 120th days of storage period. During ambient storage, stored potatoes losses weight mainly due to two physiological processes *i.e.*, transpiration and respiration. The rotting percentage of all the varieties/hybrids from 30th to 120th days of storage period has been presented in Table- 1 and Table-2.

Table-1: Rotting percentage by number in different varieties/hybrids of potato under ambient storage

Variety/Hybrid	Storage period (days)			
	30	60	90	120
Kufri Pukhraj	0.0 (0.71)	0.0 (0.71)	9.4 (3.15)	11.3 (3.43)
Kufri Pushkar	0.0 (0.71)	0.0 (0.71)	7.4 (2.81)	15.0 (3.93)
Kufri Ashoka	0.0 (0.71)	0.0 (0.71)	8.8 (3.05)	10.5 (3.32)
Kufri Anand	0.0 (0.71)	0.0 (0.71)	15.7 (4.02)	28.9 (5.42)
Kufri Sutlej	0.0 (0.71)	0.0 (0.71)	11.4 (3.45)	12.5 (3.61)
Kufri Chipsona-2	0.0 (0.71)	0.0 (0.71)	18.4 (4.30)	20.0 (4.53)
Kufri Chipsona-3	0.0 (0.71)	0.0 (0.71)	18.5 (4.36)	27.8 (5.32)
Kufri Surya	0.0 (0.71)	0.0 (0.71)	6.8 (2.70)	9.2 (3.11)
Atlantic	0.0 (0.71)	0.0 (0.71)	12.0 (3.53)	20.0 (4.53)
Kufri Lalima	0.0 (0.71)	0.0 (0.71)	18.3 (4.34)	22.2 (4.76)
J/95 – 144	0.0 (0.71)	0.0 (0.71)	12.9 (3.66)	17.7 (4.27)
J/95 - 221	0.0 (0.71)	0.0 (0.71)	8.1 (2.93)	15.8 (4.04)
J/95 - 227	0.0 (0.71)	0.0 (0.71)	8.2 (2.95)	12.1 (3.55)
J/95 - 229	0.0 (0.71)	0.0 (0.71)	17.2 (4.21)	24.8 (5.03)

REDMI NOTE 8 PRO

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2020; 8(1): 616-619
© 2020 IJCS
Received: 16-11-2019
Accepted: 18-12-2019

Nishakant Maurya
Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Mahendra Kumar Yadav
Department of Vegetable Science, CS Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Sachi Gupta
Department of Horticulture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Nishakant Maurya
Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on character association and path analysis in garden pea (*Pisum sativum* L. sub sp. *hortense* Asch.)

Nishakant Maurya, GC Yadav, CN Ram, Mahendra Kumar Yadav and Sachi Gupta

DOI: https://doi.org/10.22271/chemi.2020.v8.i1j.8327

Abstract
Forty four genotypes of garden pea including checks were evaluated to estimate correlation and path coefficient for seventeen yield contributing traits and identification of superior recombinants for their utilization in crop improvement programme during *Rabi*, 2016-17, at Main Experimental Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, in Randomized Block Design with three replication. The most important trait pod yield per plant had exhibited highly significant positive phenotypic correlation with number of pods per plant (0.794) followed by number of nodes per plant (0.253), primary branches per plant (0.231), pod circumference (0.190), shelling percentage (0.184), and number of seeds per pod (0.166). Higher magnitude of positive direct effect on pod yield per plant was exerted by plant height (1.2567) followed by number of pod per plant (0.6431), days to 50% flowering (0.2599), number of seeds per 100g pod (0.1655), node to first flower appears (0.1249), T.S.S. (0.1055), primary branches per plant (0.0940) pod length (0.0439) and 100-seed weight (0.0360). Direct contribution of these traits indicates the scope of improvements through selection for number of pods per plant and number of seeds per pod in the available germplasms.

Keywords: Garden pea (*Pisum sativum* L. sub sp. *hortense* Asch.), correlation and path analysis

Introduction

Garden pea (*Pisum sativum* L. sub sp. *hortense* Asch.) belongs to Leguminosae family and sub family Fabaceae having diploid chromosome number 2n=2x=14. It is one of the most popular vegetable crop grown as cool season crop in all over the world. The crop is grown for its green pods and dried seeds. It is harvested at tender immature stage and consumed fresh or preserved through canning or freezing. It has a prime place among all the vegetables because of its high amount of health benefiting phytonutrients such as carbohydrates, vitamin A, B and C, minerals like calcium, phosphorus, magnesium with no cholesterol and is known for its superior quality protein like lysine content, which is limiting in cereals (Monti, 1983) [8]. Moreover, pea contributes to yield of the succeeding crop in rotation by improving nitrogen status of the soil due to presence of root nodules (Sattar *et al.* 1998) [5].

Garden pea is an annual, herbaceous plant with tap root system. It is highly self-pollinated due to hermaphrodite flower, homogamy *i.e.* maturation of stigma and anthers at the same time. Most of the early cultivars the first flower produce from 5 to 11 nodes and the late cultivars start flowering at about 13 to 15 nodes. Early cultivars are often single flowered or bear some single and some double flowers while, late cultivars are usually double/triple flowered.

Breeding efforts have contributed substantially to improve yield potential, regional adaptation through resistance or tolerance to abiotic and biotic stresses, plant type and grain characteristics. The path coefficient analysis provides the partitioning of correlation coefficients into direct and indirect effect giving the relative impotence of each causes factors. The understanding of association of characters is of prime impotence in developing an efficient breeding programme.

Correlation studies provide an opportunity to study the magnitude and direction of association of one character with another, while path coefficient analysis gives the direct and indirect contribution of independent variables on dependent variable (Rathi and Dhaka, 2007) [9].

REDMI NOTE 8 PRO

Journal of Pharmacognosy and Phytochemistry 2019; 8(3): 3621-3624

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(3): 3621-3624
Received: 07-03-2019
Accepted: 09-04-2019

MK Singh
Department of Vegetable Science, NDUA &T, Ayodhya, Uttar Pradesh, India

VB Singh
Department of Vegetable Science, NDUA &T, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, NDUA &T, Ayodhya, Uttar Pradesh, India

Pushpendra Kumar
Faculty of Agriculture, Bindeshwari P. G. College Akbarpur, Ambedkar Nagar, Uttar Pradesh, India

Correspondence
MK Singh
Department of Vegetable Science, NDUA &T, Ayodhya, Uttar Pradesh, India

Studies on variability, heritability (Narrow sense) and genetic advance analysis for growth, yield and quality traits in pumpkin (*Cucurbita moschata* Duch. ex. Poir)

MK Singh, VB Singh, GC Yadav and Pushpendra Kumar

Abstract
The experiments were laid out in RBD with three replications having each experimental unit of single row with spacing of 3.0 m (R×R) × 0.5 m (P×P) involving 7 parents namely, Narendra Agrim (P_1), Narendra Amrit (P_2), Narendra Upkar (P_3), NDPK-76-1 (P_4), NDPK-724 (P_5) and NDPK-39-2 (P_6) and NDPK-12-10 (P_7) of pumpkin and their 21 F_1 hybrids produced in diallel mating design excluding reciprocals at MES, Vegetable Science, NDUA.&T, Kumarganj, Faizabad (U.P.) India in *Zaid*, 2016. The observations were recorded on parents and F_1's for twenty quantitative traits including six quality traits *viz*., node number to first male flower appearance, node number to first female flower appearence, days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest, vine length (m), internodal length (cm), number of primary branches per plant, fruit weight (kg), number of fruits per plant, equatorial circumference of fruit (cm), polar circumference of fruit (cm), flesh thickness (cm), fruit yield per plant (kg), and six quality/biochemical traits namely ascorbic acid, reducing sugars (%) non-reducing sugars (%), total sugars (%), dry matter content and total soluble solids. Analysis of variance revealed that the mean square differences due to genotypes, parents and hybrids were found highly significant for all the traits. The mean squares due to parents *vs*. hybrids was also found significant for all traits studied in experiment except for node number to first male and female flower appearance, days to first male and female flower anthesis, days to first marketable fruit harvest, average fruit weight and total sugars. The highest phenotypic as well as genotypic coefficients of variation were observed in case of node number to first male flower appearance, vine length, fruit yield per plant recorded high estimates of PCV and GCV suggesting substantial variability for the observed traits, thereby ensuring ample scope for improvement of these traits through selection. The estimates of high heritability coupled with high genetic advance as per cent of mean were observed for node number to first male flower appearance, node number to first female flower appearance and non-reducing sugar. The most important trait fruit yield per plant had exhibited significant and positive phenotypic correlation with number of fruits per plant, average fruit weight, total soluble solids, vine length, flesh thickness, ascorbic acid content, total sugars, number of primary branches per plant, equatorial circumference of fruit and negative significant association with days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest, inter nodal length and node number to first male flower appearance at phenotypic level.

Keywords: Pumpkin (*Cucurbita moschata* Duch. ex. Poir), variability, heritability (narrow sense) and genetic advance

Introduction

Pumpkin (*Cucurbita moschata* Duch. ex. Poir) is one of the most important vegetable crop of family Cucurbitaceae. It is grown throughout the world due to its good nutritional value and also higher returns to the farmers. The centre of orgin of pumpkin is central Mexico. Pumpkin is a herbaceous annual, sexually propagated vegetable allopolyploid having chromosome number 2n=2x=40. Stem is angular, five ridged without hairs, trailing and branched. Trailing vine strikes roots at nods. Leaves are deeply or shallowly lobed not pinnatifid. Fruits have diuretic and vermetic action. Seeds are non bitter, tasty and nutritious. The flowers are large and yellow coloured with showy companulate corolla. Ovary is inferior and tricarpellary. Corolla is companulate, gamopetalous, lobed. Plants are monoecious, highly cross pollinated, entamophilous with three anthers. The word pumpkin was derived from the Greek word *pepon*, which means "large melon", something round and large.
Based on commercial significance the cultivated *Cucurbita* species rank among the 10 leading vegetable crops worldwide. China and India lead the world production and other major producers are U.S., Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey (Ferriol and Pico,

REDMI NOTE 8 PRO
AI QUAD CAMERA

Int.J.Curr.Microbiol.App.Sci (2019) *8*(6): xx-xx

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 06 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.806.xx

To Study the Combining Ability and Gene Action Involve in Expression of Traits in Pumpkin (*Cucurbita moschata* Duch. ex. Poir)

M. K. Singh[1*], V. B. Singh[1], G. C. Yadav[1] and Pushpendra Kumar[2]

[1]*Department of Vegetable Science, NDUA &T, Ayodhya (U.P.), India*
[2]*Faculty of Agriculture, Bindeshwari P. G. College Akbarpur, Ambedkar Nagar, (U.P.), India*

**Corresponding author*

Keywords

Pumpkin (*Cucurbita moschata* Duch. ex. Poir), combining ability and gene action

Article Info

Accepted:
xx May 2019
Available Online:
xx June 2019

ABSTRACT

The present investigation was carried out with aims to assess the combining ability involving 7 parents namely, Narendra Agrim (P_1), Narendra Amrit (P_2), Narendra Upkar (P_3), NDPK-76-1 (P_4), NDPK-724 (P_5) and NDPK-39-2 (P_6) and NDPK-12-10 (P_7) of pumpkin and their 21 F_1 hybrids produced in diallel mating design excluding reciprocals at MES, Vegetable Science, NDUA.&T, Kumarganj, Faizabad (U.P.) India in *Zaid*, 2016. The experiments were laid out in RBD with three replications having each experimental unit of single row with spacing of 3.0 m (R×R) × 0.5 m (P×P).The observations were recorded on parents and F_1's for twenty quantitative traits including six quality traits *viz.*, node number to first male flower appearance, node number to first female flower appearence, days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest, vine length (m), internodal length (cm), number of primary branches per plant, fruit weight (kg), number of fruits per plant, equatorial circumference of fruit (cm), polar circumference of fruit (cm), flesh thickness (cm), fruit yield per plant (kg), and six quality/biochemical traits namely ascorbic acid, reducing sugars (%) non-reducing sugars (%), total sugars (%), dry matter content and total soluble solids. The analysis of variance for combining ability revealed that there were significant differences for all the traits. Mean squares due to general combining ability were observed significant for all the traits and specific combining ability were observed significant for all traits except days first fruit harvest and average fruit weight. The parents Narendra Upkar (P_3), NDPK-39-2 (P_6) and NDPK-12-10 (P_7) were found good general combiner for fruit yield per plant and number of fruits per plant. Out of the best five significant specific crosses with high *per se* performance for fruit yield per plant, three crosses NDPK-76-1 x NDPK-39-2 (P_4 x P_6), Narendra Upkar x NDPK-12-10 (P_3 x P_7) and (Narendra Upkar x NDPK-724) P_3 x P_5 indicated good specific combing ability. Both additive and dominance variance were found important in the inheritance of most of the traits, whereas dominance variance were found more prominent than the additive variance. Average degree of dominance revealed the presence of over dominance for all the traits. The proportions of genes ($\hat{H}_2/4\hat{H}_1$) in the parents were less than 0.25 for all the traits indicating asymmetrical distribution of alleles at loci showing dominance. In general the proportions of dominant and recessive genes in parents $[4\hat{D}\,\hat{H}_1)^{1/2}+\hat{F}\,/\,(4\hat{D}\,\hat{H}_1)^{1/2}-\hat{F}]$ were more than unity with positive $\hat{F}$ value for all traits indicating major contribution of dominant genes.

ESTIMATION OF GENETIC VARIABILITY, HERITABILITY AND SCOPE OF IMPROVEMENT IN GARDEN PEA UNDER ALKALI SOIL CONDITION (*Pisum sativum* L. sub sp. *hortense* Asch.)

Department of Vegetable Science
Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) 224 229

Abstract

Forty four genotypes of garden pea including checks were evaluated for magnitude of genetic variability, heritability and genetic advance for seventeen yield contributing traits during Rabi, 2016-17, at Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, in Randomized Block Design and replicated thrice. The phenotypic coefficient of variation (PCV) was higher than their corresponding genotypic coefficient of variation (GCV) for all the characters. High genotypic coefficient of variation (GCV) as well as phenotypic coefficient of variation (PCV) was observed for primary branches per plant (36.34 and 34.46) and pod yield per plant (24.12 and 21.79). High heritability coupled with high genetic advance in per cent of mean were observed for primary branches per plant and pod yield per plant. High estimate of heritability along with high genetic advance in per cent of mean indicates the scope of improvements through selection in the available germplasms.

Key words: Garden pea (Pisum sativum L. sub sp. hortense Asch.), variability, heritability, genetic advance, genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV).

Introduction

Garden pea (*Pisum sativum* L. sub sp. *hortense* Asch.) belongs to Leguminosae family and sub family Fabaceae having diploid chromosome number 2n=2x=14. It is one of the most popular vegetable crop grown as cool season crop in all over the world. It is harvested at tender immature stage and consumed fresh or preserved through canning or freezing. It has a prime place among all the vegetables because of its high amount nutrient content mainly digestible proteins and other health benefiting phytonutrients such as carbohydrates, vitamin A, B and C, minerals like calcium, phosphorus and magnesium with no cholesterol. Moreover, pea contributes to yield of the succeeding crop in rotation by improving nitrogen status of the soil due to presence of root nodules (Sattar *et al.* 1998).

Garden pea is an annual herbaceous plant with tap root system. It is highly self-pollinated due to hermaphrodite sex form, homogamy *i.e.* maturation of stigma and anthers at the same time. Most early cultivars produce the first flower from nodes 5 to 11 and the late cultivars start flowering at about nodes 13 to 15. Early cultivars are often single flowered or bear some single and some double flowers while, late cultivars are usually double/triple flowered.

Breeding efforts have contributed substantially to improve yield potential, regional adaptation through resistance or tolerance to abiotic and biotic stresses, plant type and grain characteristics. The quantum of genetic variability and the extent, to which heritable and non-heritable variations are related to the characters determines the extent of genetic improvement. Therefore, present investigation was carried out to assess the genetic variability and nature of association between yield and its component traits in garden pea.

The study of genotypic and phenotypic coefficients of variation give a clear cut data about extent of variability present in a plant population and a relative measure of efficiency of selection of genotypes based on phenotype in a highly variable population.

The present investigation was carried out to assess the nature and magnitude of genotypic and phenotypic coefficients of variation, heritability in broad sense, genetic advance and genetic advance as per cent of mean in 44 different genotypes for 17 characters under Faizabad conditions.

Materials and Methods:

The experimental material for the present investigation was comprised of 44 genotypes including 4 checks were replicated thrice in Randomized Complete Block Design. The experiment was carried out at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, during *Rabi* season of 2016-17. The whole investigation was conducted under the scientific management practices. During study, observations for 50% flowering, plant height, number of nodes per plant, intermodal length, node to first flower appearance, node to first pod appearance, primary branches per plant, pod circumference, pod length, number of seeds per pod, number of pods per plant, shelling per cent, 100-seed weight, number of seeds per 100g pod, number of pods per 100g, total soluble solid (T.S.S.) and pod yield per plant were recorded on five randomly selected plants from each treatment.

The recorded data from experiment for seventeen characters in garden pea was subjected to the following statistical analysis such as analysis of variance for the design of experiment (Panse and Sukhatme, 1967), estimation of genotypic and phenotypic coefficients of variation, heritability in broad sense and genetic advance (Burton and de Vane, 1953) and expected genetic advance in per cent of mean (Johnson *et al.*, 1955).

Results and Discussion:

The mean sum of squares due to genotypes were highly significant for all the characters (Table- 1), indicating that there are considerable variation among the genotypes with respect to the characters under study. In other words, the performance of all the genotypes with respect to characters studied were statistically different. The result indicating the better chance of selection in the available garden pea genotypes.

Table- 1: Analysis of variance for seventeen quantitative characters in garden pea

S. No.	Characters	Source of variation		
		Replications	Treatments	Error
	d.f.	2	43	86
1.	Days to 50% flowering	0.70	115.23**	3.10
2.	Plant height (cm)	6.64	526.80**	9.54
3.	Number of nodes per plant	0.24	7.27**	0.50
4.	Internodal length (cm)	0.00	1.19**	0.03
5.	Node to first flower appearance	0.11	7.47**	0.30
6.	Node to first pod appearance	0.06	7.53**	0.46
7.	Primary branches per plant	0.00	0.34**	0.01
8.	Pod circumference (cm)	0.00	0.41**	0.04

Journal of Pharmacognosy and Phytochemistry 2020; 9(1): 1410-1412

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2020; 9(1): 1410-1412
Received: 10-11-2019
Accepted: 13-12-2019

Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

VB Singh
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Deepak Maurya
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Manjeet Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Corresponding Author:
Veerendra Kumar
Department of Vegetable Science College of Horticulture & Forestry, A.N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya, Uttar Pradesh, India

Studies on genetic divergence in sponge gourd (*Luffa cylindrica* L. Roem.)

Veerendra Kumar, VB Singh, GC Yadav, Deepak Maurya and Manjeet Kumar

Abstract
The experiment was conducted during the spring-summer season, 2017 in Eastern Uttar Pradesh. to evaluate the nature and magnitude of genetic divergence among the thirty genotypes of bitter gourd were carried out by using Mahalanobis D^2 statistics. Thirty genotypes were grouped into 7 different non-overlapping clusters. The highest number of genotypes was presented in cluster III which contained 9 entries followed by cluster V which contains 8 entries, cluster VI which contained 5 entries, cluster I which contained 4 entries, cluster IV which contained 3 entries and cluster II possess 1 entries respectively. Highest estimates of genetic advance in per cent of mean was recorded for vine length (80.31%), node number to anthesis of first staminate flower (66.23%), number of fruits per plant (45.65%), total fruit yield/plant (38.42%). Moderate genetic advance in per cent of mean was estimated in number of primary branches per plant (37.86%), node number to anthesis of first staminate flower (37.65%), fruit length (37.40%), number of nodes per vine (35.35%), average fruit weight (31.68%), fruit diameter (29.79%) whereas days to anthesis of first pistillate flower (26.12%), days to anthesis of first pistillate flower (23.80%), days to first fruit harvest (21.58%) showed low genetic advance in per cent of mean. Vine length contributed maximum towards genetic diversity (26.67%), followed by fruits per plant (25.75 %), days to anthesis of first pistillate flower (13.69%), average fruit weight (9.43%), number of primary branches per plant (8.51%), node number to anthesis of first staminate flower (7.36%), fruit length (4.37%) and total marketable fruit yield per plant in sponge gourd.

Keywords: genetic divergence and sponge gourd

Introduction
Luffa [*Luffa cylindrica* L. (Roem) *Syn.* L. *ageyeptica* Mill.] commonly called as sponge gourd, Loofah, vegetable sponge or dish cloth gourd, is a member of family Cucurbitaceae having diploid chromosome number 2n=2x=26.It originated in subtropical Asian region particularly India (Kalloo, 1993) [2]. Sponge gourd is an annual cucurbit plant produces fruits containing a fibrous vascular system with various vines and cylindrical tenangled fruit. Leaves are deltoid to nearly orbicular exteriorly, but pointed at the apex and usually three to seven lobed with dentate margin (Whitaker and Davis, 1962) [6]. Sponge gourd is monoecious crop with branches tendrils. Flowers are yellow and showy having five petals. The inflorescence of staminate flowers is on raceme, while the pistillate flowers are solitary and have short to long peduncle. It is commonly grown for its tender marketable green fruits for vegetable purpose as well as for sponge of mature fruits which is used for scrubbing of body skin and utensil purposes. Fruits are rich in Iron Vitamin A and C. It has certain medicinal uses. The cooked fruit are easily digestible and very appetizing therefore it is recommended to the patients suffering from malaria or other seasonal fevers.
Luffa *(Luffa cylindrica* (L.) MJ. Roem syn. *L. aegyptica* Mill.) commonly called as sponge gourd, loofah, vegetable sponge or dish cloth.It is one of the most important cucurbits grown extensively throughout the tropical and sub-tropical regions of the country and world, The crop belongs to the family Cucurbitaceae which includes about 118 genera and 855 species. Its unripe tender fruits are popular and well known culinary in India with good nutritive value and high yield potentials. The tender fruits are rich in carbohydrates, vitamin A, vitamin C and iron.

Material and Methods
Thirty genotypes (including Pusa Chikni as check variety) of sponge gourd having diverse origin were evaluated at Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, during the spring-summer season, 2017.
The experiment was lay out in a randomized block design with three replications in individual plot size (3m x 2.5m). The distance maintained between row to row and plant to plant was 2.5

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

Studies on sprouting behaviour of different varieties/hybrids of potato (*Solanum tuberosum* L.)

Satish Kumar, GC Yadav, Nishakant Maurya, Atul Yadav and Dheeraj Yadav

Satish Kumar
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, N.D. University of Agriculture & Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Nishakant Maurya
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Atul Yadav
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Dheeraj Yadav
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Satish Kumar
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Abstract
The experiment was conducted with thirty six varieties/hybrids replicated thrice in Completely Randomized Design (CRD) during the summer of 2007 at the Laboratary of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya (U.P.). The small gunny bags of 5kg capacity were kept for 120 days at ambient storage condition. The minimum sprouting was observed by numbers and sprout weight (g per kg tubers) in varieties/ hybrids B-420 (2), J/95-229, Kufri Pushkar, Kufri Ashoka and Kufri Lalima after 120 days of storage at ambient conditions. However, maximum sprouting was recorded in hybrids DSP-19, MS/92-1090, and MS/99-1871 after 120 days of storage in ambient conditions.

Keywords: Variety/hybrids, sprouting, potato, ambient condition

Introduction
The potato (*Solanum tuberosum* L.) is one of the most efficient horticultural food crop. It belongs to family solanaceae, which constitutes around 85 genera with 2200 species and Solanum is the largest genus with 1700 species. Among major potato growing countries, India ranks third after China and Russian Federation. The present area under potato in India is about 2.117 million hectares with production and productivity of 43.417 million tones and 20.50 t/ha (Anonymous, 2016) [1] respectively.

The potato is an easily grown plant that produces more food on less land. One hectare of potatoes can yield food value of 2-4 hectares of grain. The dry matter production in potato is 47.6 kg/ha/day, whereas in wheat and rice it is 18.1 and 12.4 kg/ha/day, respectively. Storage studies in potatoes stored at higher temperatures have been conducted by different workers but information are insufficient. In the present status of information on identification of varieties/hybrids with good shelf-life for a few months are desired.

Method and Materials
The present investigation was carried out at the laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya (U.P.) during March to June, 2007. The experimental material comprised of thirty six varieties/hybrids of potato and were evaluated in Completely Randomized Design with three replications.

The recorded data in Completely Randomized Design (CRD) were analyzed statistically by the method suggested by Cochran and Cox (1963) [3].

Result and Discussion
Studies on changes during ambient storage of different varieties/hybrids of potato revealed that the minimum sprouting was observed by numbers and sprout weight (g per kg tubers) in varieties/ hybrids B-420 (2), J/95-229, Kufri Pushkar, Kufri Ashoka and Kufri Lalima after 120 days of storage at ambient conditions. The result of sprouting behavior and sprout weight (g per kg tubers) of all the varieties/hybrids from 30th to 120th days of storage period has been presented in Table- 1 and Table- 2, respectively.

69

REDMI NOTE 8 PRO

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN:
P-ISSN:
JPP 2019; 8(1): 291-294
Received: 10-11-2018
Accepted: 10-12-2018

Devesh Tiwari
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Kumar Maurya
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Aman Kumar
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Sriom
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Devesh Tiwari
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Correlation coefficient and path analysis for yield and its component traits in Brinjal (*Solanum melongena* L.)

Devesh Tiwari, GC Yadav, Vipin Kumar Maurya, Aman Kumar and Sriom

Abstract
The study conducted to know the association among different morpho-economical traits of brinjal. The experiment comprising forty diverse genotypes, grown in randomized block design with three replications. The experiment was conducted in Randomized Complete Block Design with three replications at the Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya (U.P.), during autumn-winter season 2016-17. The most important trait, total fruit yield per plant had exhibited highly significant and positive phenotypic correlation with marketable fruit yield per plant (0.9635), followed by unmarketable fruit yield per plant (0.6003), fruits per plant (0.5405), crop duration (0.4345), primary branches per plant (0.3156) and fruit length (0.2426). The higher magnitude of positive direct effect on fruit yield was exerted by marketable fruit yield per plant (0.8423) and unmarketable fruit yield per plant (0.2470) at phenotypic level. However, the positive direct effects of rest of the traits were very low. The negative direct effect on yield by either of the dependent traits were very low. However, plant height and average fruit weight contributed considerable negative direct effects on total fruit yield per plant.

Keywords: correlation, path, direct indirect, brinjal, *Solanum melongena*

Introduction

Brinjal (*Solanum melongena* L., 2n=2x=24) belongs to sub genus Leptostemonum section Melongena of the family Solanaceae, sub family Solanoideae and Tribe Solaneae. It is worldwide known as aubergine or guinea squash which is one of the most popular and major vegetable crop in India and other parts of the world.

Brinjal or egg plant is a perennial but grown commercially as annual crop. Inflorescence is often solitary but some time it constitutes a cluster of 2-5 flowers. Solitary or clustering nature of inflorescence is a varietal character. Flower is complete and hermaphrodite. Heterostyly is a common feature, and fruit setting flower consist of long (70-85%) and medium styled (12-55%) flower. The non-fruit setting flowers consist of short styled and pseudo styled.

Egg plant is usually self-pollinated but the extent of cross-pollination has been reported as high as 29% and hence it is classified as often cross-pollinated or facultative cross-pollinated. Flower generally emerges 40-45 days after transplanting. Anthesis occurs at about 6-8 a.m. in August-September and usually between 9.30-11.15 a.m. during winter (December-January). Stigma receptivity is highest during anthesis *i.e.* flower opening. Anthers usually dehisce 15-20 minutes after the anthesis.

It is easily cultivated in almost all parts of India except higher altitudes. It is a warm season crop and highly susceptible to frost. A long and warm growing season is desirable for successful brinjal production. The main crop of brinjal is raised during autumn- winter season however; some production is obtained during spring-summer season also. But during spring-summer season high temperature (above 35°C) causes drastic reduction in brinjal production due to poor fruit set. The optimum temperature for growth and fruit set is 15.5-21.1°C. Many of the round varieties usually set fruit at slightly lower temperature and are susceptible to frost and long-fruited varieties set fruits at higher temperature and show tolerance to frost.

Materials and Methods

The study comprised 40 genotypes of Brinjal including four checks. The experiment was conducted in Randomized Complete Block Design with three replications at the Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya (U.P.), during autumn-winter season 2016-17.

REDMI NOTE 8 PRO
AI QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry 2019; 8(1): 1779-1782

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 1779-1782
Received: 04-11-2018
Accepted: 06-12-2018

Vipin Kumar Maurya
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Gulab Chand Yadav
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Aman Kumar
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Devesh Tiwari
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Nishakant Maurya
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Sriom
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Correspondence
Vipin Kumar Maurya
Department of Vegetable Science, NDUA&T, Kumarganj, Ayodhya, Utter Pradesh, India

Studies on extent of variability, heritability and genetic advance in okra [*Abelmoschus esculentus* (L.) Moench]

Vipin Kumar Maurya, Gulab Chand Yadav, Aman Kumar, Devesh Tiwari, Nishakant Maurya and Sriom

Abstract
The experiment was conducted at Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya during *Kharif*, 2016-17 in Randomized Complete Block Design with three replications using thirty genotypes of okra collected from different sources to study the extent of variability, heritability and genetic advance in per cent of mean for different quantitative traits. The analysis of variance for the design of experiment indicated highly significant differences among the genotypes for all the characters. Based on mean performance of genotypes NDO-33 (212.16) followed by NDO-31 (199.03), NDO-24 (195.50), NDO- 35 (190.20) and NDO-17 (189.23) were found as five most promising genotypes for fruits yield per plant. High magnitude PCV were observed in case of unmarketable fruit yield per plant (31.34) followed by marketable fruit yield per plant (21.46), number of fruits per plant (20.78), total fruit yield per plant (19.70) and branches per plant (14.60). Moderate PCV along with GCV were recorded for number of branches per plant (14.60, 9.57) followed by fruit circumference (12.86, 8.11), fruit length (12.26, 8.36), average fruit weight (10.23, 9.42) and plant height (10.88, 9.00). High heritability were estimated for total fruit yield per plant (93.82) followed by unmarketable fruit yield per plant (87.68), average fruit weight (84.86), days to 50% flowering (84.54) and marketable fruit yield per plant (81.13). High heritability coupled with high genetic advance were estimated for total fruit yield per plant (93.82, 38.80) followed by unmarketable fruit yield per plant (87.68, 56.60) and marketable fruit yield per plant (81.13, 35.87) which indicating opportunity for high selection response.

Keywords: Variability, PCV, GCV, heritability, genetic advance, okra (*Abelmoschus esculentus* (L.) Moench)

Introduction

Okra [*Abelmoschus esculentus* (L.) Moench 2n = 2x=130] is one of the important member of the family malvaceae and is well known by many regional names as lady's finger in England, Gumbo in USA, Dherosh in Bangladesh, Huang Giu Kui in China, Quingombo in Spanish, Bhindi in Pakistan and India. Okra is an African word and is native to northern Africa including the area of Ethiopia and Sudan. It is a summer and rainy season crop and is widely cultivated from tropics to sub tropics.

Okra (*Abelmoschus esculentus* L.) is probably an amphidiploids (allotetraploid) derived from *Abelmoschus tuberculatus* (2n = 58), a wild species from India, and a species (*Abelmoschus ficulneus* (L.) Wight and Arn. ex Wight) with 2n = 72 chromosomes. Another edible okra species are *Abelmoschus caillei* (A. Chev.).Stevels occurs in the humid parts of West and Central Africa. There are strong indications that *Abelmoschus caillei* is amphidiploids with *Abelmoschus esculentus* being one of the parental species. The lowest chromosome number 2n=56 reported in *Abelmoschus angulosus* (Ford, 1938) whereas, the highest chromosome number 2n=196 reported in *Abelmoschus manihot* var. *Caillei* (Singh and Bhatnagar, 1975; Siemonsma, 1982a, 1982b) [14, 15].

According to Vavilov, it was probably domesticated in the Ethiopian region but, according to Murdock, it is originated in West Africa (Joshi *et al*., 1974) [6]. Okra was earlier included in the genus *Hibiscus*, section *Abelmoschus* in the family malvaceae (Linnaeus, 1753). The section *Abelmoschus* was subsequently proposed to be raised to the rank of distinct genus by Medikus, 1787. The wider use of *Abelmoschus* was subsequently accepted in the taxonomic and contemporary literature. This genus is distinguished from the genus *Hibiscus* by the characteristics the calyx, spathulate, with five short teeth, connate to the corolla and caduc[illegible] flowering (Kundu and Biswas, 1973 and Terrell and Winters, 1974) [8].

European Journal of Biotechnology and Biosciences
ISSN: 2321-9122; Impact Factor: RJIF 5.44
Received: 18-11-2018; Accepted: 20-12-2018
www.biosciencejournals.com
Volume 7; Issue 1; January 2019; Page No. 22-26

Importance of PGRs in vegetable production: A review

Pradip Kumar Saini[1], Kuldeep Kumar[2], Dr. DP Singh[3], Dr. RK Yadav[4], Dr. GC Yadav[5]
[1, 4, 5] Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India
[2, 3] Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Abstract
Indian Agriculture become more mechanized and science based by using inputs and the PGRs are among of them; PGRs has quicker impact on vegetative as well as yield of the crops. As it has various advantages like less time consuming to treat the plant and environment friendly. Vegetables crops are rich sources of vitamins and minerals. Use of growth regulators in vegetable production must be specific their action and toxicologically and environmentally safe. The physiological activity of vegetable crops regulate and after the application of growth regulator finally enhance the vegetable production.

Keywords: vegetable crop, PGRs, production

Introduction
Plant hormones are chemicals in plants that regulate cellular processes. They are usually found in small amounts throughout the plant. These hormones are very important as they determine many different attributes of a plant. Plant hormones can be natural or synthetic. Plant hormones are also known as phytohormones. Thimann in 1948 was coined the term "Phytohormone" The five major plant hormones are auxins, gibberellins, cytokinins, abscisic acid, and ethylene. (P. Hazra and M.G. Som, 2006) [10]. These hormones will work independently or together to influence plant growth and health. Auxins and gibberellins help promote plant growth, particularly in stem elongation. Cytokinins promote cell division and are produced in growing areas of plants. Abscisic acid plays a role in cell dormancy and is involved in the opening and closing of the stomata on leaves. Finally, ethylene is a gas that is produced by ripening fruits. Ethylene is one particular hormone that is often synthetically produced so gardeners can purposefully ripen fruits of many plants at the same time. The classes are discussed in following table 1

Auxin
Charles Darwing was the first who proposed the existence of auxin in 1880. It was the first class growth regulator that was discovered. Auxins are those compounds that give positive effect on formation of bud, enlargement of cell and root initiation and they are also helpful for the formation of other growth hormones. IAA is natural occurring hormone while NAA, IBA, 2-4D etc. are synthetic in nature.

Gibberellin
Kurosava was the Japanese scientist who discovered gibberellins in 1926. It is the second growth regulator. It was extracted from the fungus "*Gibberella fujikuroi*" which is the causal organism of "foolish seedling disease". GA stimulate germination of seed and maturation of flower and fruit.

Cytokinins
Skoog in 1995 experimented that when pith tissues of "*Nicotiana tabaccum*" were separated from the vascular tissues they grew without division of cell. There are so many different synthetic cytokinins such as 6-benzylamino purine (BAP), kinetin, 6-(benzyl-amino)-9-(2-tetrahydropyranyl)-9H-purine (PBA), 1,3-diphenylurea, thidiazuron (TDZ), etc.

Abscisic acid
It is also called plant stress hormone. It act as inhibitory chemical compound that gives direct effect on growth of bud, seed and dormancy of bud. It has inhibitory effect and occurs naturally in plants. It inhibit mRNA and synthesis of protein.

Ethylene
This hormone is a gaseous plant hormone which is synthesized from methionine and it is synthesized in all organs of plant.

Contribute of PGRs in vegetable production
Chilli
The treatments 2,4-D @ 2ppm, triacontanol @ 5ppm, NAA 40ppm and GA_3@ 10ppm produced 28.75%, 25.70%, 13.61% and 2.30% maximum fruit yield over control. It was recorded that maximum net profit and B: C ratio was found in case of 2ppm 2,4-D. The use of GA_3 as foliar spray was not economical (Chaudhary *et al.*, 2006) [7]. Maximum seed yield per plant (8.30 g), seed yield per fruit (0.35 g), per plant average fresh weight of fruits (39 g) and per plant average dry weight of fruits (19.67 g) were obtained by spraying of NAA @ 40ppm as against control (Patel *et al.*, 2016) [16]. In capsicum, NAA @ 60ppm gave maximum plant height (120.59 cm), number of branches (16.05), days to first flowering (32.51), per plant number of flowers (11.83), weight of fruit (169.66g), per plant number of fruits (9.87), per fruit number of seeds (110.78), per plant yield (1.67 kg) and per plot yield of fruit (15.07kg), yield per hectare (69.76t) were recorded (Singh *et al.*, 2017) [17]. Different concentrations of growth regulators such as NAA (25, 50 and 75ppm), GA_3 (20, 40 and 60ppm), 2, 4-D (5, 7.5 and 10ppm) and ethrel (300, 400 and 500ppm) were used in chilli and applied after 30 and 60 days after transplanting. It was recorded that NAA @ 75ppm gave maximum yield per plant (182.31g) and yield per hectare (6.37t). On the other hand, GA_3 @ 20 and 60ppm treated plants gave maximum plant

REDMI NOTE 8 PRO
AI QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry 2019; 8(1): 564-565

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 564-565
Received: 07-11-2018
Accepted: 08-12-2018

Satish Kumar
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Nishakant Maurya
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Atul Yadav
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Manjeet Kumar
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Satish Kumar
Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Evaluation of potato (*Solanum tuberosum* L.) varieties/hybrids for their post-harvest physiological weight losses under ambient conditions

Satish Kumar, GC Yadav, Nishakant Maurya, Atul Yadav and Manjeet Kumar

Abstract
The experiment was conducted with thirty six varieties/hybrids replicated thrice in Completely Randomized Design (CRD) during the summer of 2007 at the Laboratary of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj) Ayodhya (U.P.). The small gunny bags of 5kg capacity were kept for 120 days at ambient storage condition. The physiological losses in weight was increases continuously in all the treatments from 30 to 120 days of storage period under ambient conditions. The minimum physiological loss in weight was recorded in varieties/hybrids J/95-229, Kufri Sutlej, J/95-221 and B-420(2) after 120 days of storage under ambient conditions.

Keywords: Variety/hybrids, Weight loss, Potato, post-harvest, ambient condition

Introduction
The potato (*Solanum tuberosum* L.) is one of the most efficient horticultural food crop. It belongs to family solanaceae, which constitutes around 85 genera with 2200 species and Solanum is the largest genus with 1700 species. Among major potato growing countries, India ranks third after China and Russian Federation. The present area under potato in India is about 2.117 million hectares with production and productivity of 43.417 million tones and 20.50 t/ha (Anonymous, 2016) [1] respectively.

The potato is an easily grown plant that produces more food on less land. One hectare of potatoes can yield food value of 2-4 hectares of grain. The dry matter production in potato is 47.6 kg/ha/day, whereas in wheat and rice it is 18.1 and 12.4 kg/ha/day, respectively. Storage studies in potatoes stored at higher temperatures have been conducted by different workers but information are insufficient. In the present status of information on identification of varieties/hybrids with good shelf-life for a few months are desired.

Method and Materials
The present investigation was carried out at the laboratory of Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj) Ayodhya (U.P.) during March to June, 2007. The experimental material comprised of thirty six varieties/hybrids of potato and were evaluated in Completely Randomized Design with three replications.

The recorded data in Completely Randomized Design (CRD) were analyzed statistically by the method suggested by Cochran and Cox (1963) [3].

Result and Discussion
Studies on changes during ambient storage of different varieties/hybrids of potato revealed that physiological loss in weight increases continuously in all the varieties/hybrids from 30th to 120th days of storage period. During ambient storage, stored potatoes losses weight mainly due to two physiological processes *i.e.*, transpiration and respiration. The result of physiological losses of all the varieties/hybrids from 30th to 120th days of storage period has been presented in Table- 1.

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2019; 7(3): 261-263
© 2019 IJCS
Received: 08-03-2019
Accepted: 12-04-2019

Mahendra Kumar Yadav
Department of Vegetable Science, ND University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Department of Vegetable Science, ND University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, ND University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Nishakant Maurya
Department of Vegetable Science, ND University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Durga Prasad
Department of Genetics and Plant Breeding, CS Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Arun Kumar Verma
Department of Vegetable Science, CS Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Correspondence
Mahendra Kumar Yadav
Department of Vegetable Science, ND University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Extent of genetic variability, heritability genetic advance for quantitative traits in tomato (*Solanum lycopersicon* [mill.]Wettsd.)

Mahendra Kumar Yadav, CN Ram, GC Yadav, Nishakant Maurya, Durga Prasad and Arun Kumar Verma

Abstract
The present investigation was carried out to evaluate 47 genotypes with 3 check varieties in respect of genetic variability, heritability and genetic advance for twelve yield contributing traits. Analysis of varience revealed, moderate to high level of genetic variability among different genotypes for all yield contributing triats. In general the value of phenotipic coefficient of variation (PCV) was higher than their respective genotypic coefficient of variation (GCV), but the extent was quite low. This indicates that there is very less environmental influence on the expression of characters. High value of GCV was recorded for the characters such as number of fruit per plant (53.15), unmarketable fruit yield per plant (46.93), average fruit weight (38.67), marketable fruit yield per plant (35.73), total fruit yield per plant (35.33). While low magnitude of coefficient of variability was exhibited by total soluble solid (6.19) and days to 50 per cent flowering (8.70).

Keywords: Genetic variability, Gcv, Pcv, heritability (h^2), genetic advance, tomato (*Solanum lycopersicon* [mill.] Wettsd.)

Introduction
Tomato (*Solanum lycopersicon* [Mill.] Wettsd.) Belongs to Solanaceae family and the genus *Solanum*. It is a herbaceous annual to perennial in nature and sexually propagated crop plant with perfect flowers. It is a day neutral plant and mainly self-pollinated but a certain percentage of cross-pollination also occurs. It is a warm season crop reasonably resistant to heat, drought and grows under wide range of soil and climatic conditions. It is widely cultivated vegetable throughout the world and ranks second in importance after potato in many countries including India. In India, total area was 0.808 million hectares with production 19.69 million tonnes and there productivity 24.4 tonnes per hectare (Anonymous, 2016) [1].
There are four to eight flowers in each compound inflorescence. Anthesis occurs from 7:00-8:00AM and dehiscence from 9:00-11:00AM. All the species of tomato are native to western South America (Rick, 1976) [1]. Growth habit ranged from strongly determinate (bushy type) to indeterminate types.
Tomato is considered as "Poor man's Orange" and universally treated as 'Protective Food'. Tomato fruits are eaten raw or cooked. Tomato in large quantities is used for the preparation of several processed items like soup, juice, ketchup, puree, paste, powder and ripen fruits are used as raw vegetable in salad. Tomato is a good appetizer and its soup is said to be a good remedy for patients suffering from constipation.
Genetic variability and its inheritance pattern is paramount significant in challenging out strategy for effective crop improvement in terms of selection response. Keeping in view the present study was under taken to find out the presence of variability, pattern of heritability and to judge the genetic advance under selection.

Materials and Methods
The experiment was conducted with 47 genotypes including 3 checks *viz*. Arka vikas, NDT-7 and DBRT-2-1 in Randomized Block Design with three replications at Main Experimental Station of Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya, Uttar Pradesh, India. The observations were recorded on yield and its attributing traits.

73

REDMI NOTE 8 PRO
AI QUAD CAMERA

72

Int.J.Curr.Microbiol.App.Sci (2019) 8(2): 952-960

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 8 Number 02 (2019)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2019.802.110

Study the Correlation Coefficient and Path Coefficient for the yield and yield Component of Bitter Gourd (*Momordica charantia* L.)

Deepak Maurya[1]*, V.B. Singh[1], G.C. Yadav[1], VeerendraKumar[1], Shivam Dubey[2] and Ashok Kumar Pandey[3]

[1]*Department of Vegetable Science,* [2]*Department of GPB, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad- 224 229, (U.P.), India*
[3]*Department of Horticulture, DRMLU, Faizabad-224 001, U. P. (India)*

**Corresponding author*

Keywords

Path-coefficient, Correlation analysis, Bitter gourd genotypes, etc.

Article Info

Accepted:
10 January 2019
Available Online:
10 February 2019

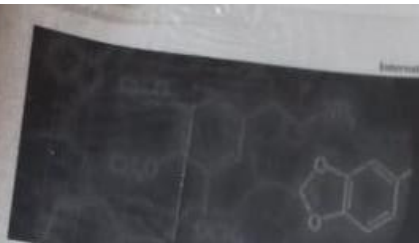
ABSTRACT

The present investigation entitled "Study the correlation coefficient and path coefficient for the yield and yield component of bitter gourd (*Momordica charantia* L.) was carried out at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during summer-2017, to evaluate the available genotypes, to estimate the correlation coefficient and to work out the path coefficient analysis for yield and its component traits of 30genotypes, with three replications in randomized block design. Estimates of correlation and path coefficients can define the mutual relationship between plant characters and determine component characters on which selection can be based for improvement in yield. It might be easier to increase yield by increasing the smallest yield components on an otherwise good cultivar. Thirty genotypes of bitter gourd were evaluated for yield contributing characters to observe their associations and direct and indirect effect on fruit yield. In most cases the genotypic correlation coefficient was higher than the respective phenotypic correlation coefficients indicating the suppressive effect of environment modified phenotypic expression of these characters by reducing phenotypic correlation values. The higher magnitude of coefficient of variation at phenotypic as well as genotypic levels were observed for phenotypic in no. of fruit per plant followed by fruit yield per plant (kg), vinelength (m), fruit length (cm), node no. to anthesis of first staminate flower, average fruit weight (g), node no. to anthesis of first pistillate flower, no. of nodes per vine and lower value in days of first fruit harvest followed by days to anthesis of first pistillate flower, days to anthesis of first staminate flower, fruit diameter. The phenotypic correlation coefficients between different characters were generally similar in magnitude and nature to the corresponding genotypic correlation coefficient. The significant and positive correlation with yield per plant was observed at phenotypic level with average fruit weight and no. of fruits per plant. The analysis of path coefficient indicating appreciable amount of direct positively effect of no. of fruits per plant and fruit yield per plant followed by vine length on fruit yield per plant.

72

REDMI NOTE 8 PRO
AI QUAD CAMERA

International Journal of Chemical Studies 2018; 6(4): 232-234



International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(4): 232-234
© 2018 IJCS
Received: 07-05-2018
Accepted: 10-06-2018

Maneesh Pandey
Department of Vegetable Science
NDUA & T, Kumarganj
Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science
NDUA & T, Kumarganj
Faizabad, Uttar Pradesh, India

Correspondence
Maneesh Pandey
Department of Vegetable Science
NDUA & T, Kumarganj
Faizabad, Uttar Pradesh, India

Heterosis for earliness and yield contributing traits in brinjal (*Solanum melongena* L.)

Maneesh Pandey and GC Yadav

Abstract
The present investigation was conducted to found out the magnitude of the heterosis in brinjal. Eight parents were crossed in diallel excluding reciprocal to developed 28 crosses. The hybrids al song with parents were evaluated in 2 consecutive years. The data were recorded on plant height, number of primary branches per plant, days to 50% flowering, days to first fruit harvest, harvest duration, average fruit weight, marketable fruit yield, which are contributing earliness and yield. For days to 50% flowering, and days to first fruit harvest maximum negative standard heterosis, and heterobeltiosis, were shown by cross combination $P_5 \times P_7$ and $P_3 \times P_8$, respectively. For days to first fruit harvest, high magnitude of standard heterosis and heterobeltiosis were shown by $P_5 \times P_7$. For marketable fruit yield, of $P_5 \times P_7$ and $P_2 \times P_7$ were found promising for earliness and yield. The cross combinations inbred P_1, P_2, P_6, and P_8 were prosing, therefore these parental lines could be used for development hybrids for early and high yield.

Keywords: Heterosis, heterobeltiosis, brinjal, earliness, yield

Introduction
Eggplant (*Solanum melongena* L. 2n=24) or brinjal is a important solanaceous vegetable, which is known by various name in India *viz.*, Baigan (Hindi), Badanekai (kannada), Vangi (Marathi), Kathirikai (Tamil), Vankai (Telugu) and worldwide known as aubergine (France) or guinea squash. Brinjal is one of the most popular and major vegetable crop in India and some other parts of the world. It is a self-pollinated and annual herbaceous crop, probably originated in India and shows secondary diversity in South East Asia. It is being grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, France, Italy and U.S.A. In India, brinjal occupies an area of 6.62 lakh ha with annual production of 125.88 lakh metric tonnes & productivity stand at 18.9 metric tons per hectares. In Uttar Pradesh, Agra, Meerut, Lucknow, Kanpur, Aligarh, Chitrakoot and Gorakhpur districts having maximum area and production (Annonymous, 2016) [1].

The heterosis breeding programme mainly depends on the choice of superior parents for hybridization and the knowledge of combining ability and magnitude of gene action involved in the expression of component traits. Among the various mating designs diallel cross techniques has been most frequently used to determine general and specific combining ability variances and their effects in brinjal (Bavage *et al.* 2005; Panda *et al.* 2005; Suneetha *et al.* 2006 & Hazra *et al.* 2010) [4, 11, 13, 7]. Hence this study was conducted to develop brinjal hybrid with early and higher yield.

Materials and Methods
Field experiment was conducted at (MES) Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) India. The materials for the present investigation comprised of 8 divers genotype of brinjal viz.; Siliguri (P_1), Mukta Kesi (P_2), Pant Rituraj (P_3), NDW-White-1 (P_4), Punjab Sadabahar (P_5), NDB-S-1-1 (P_6), KS-224 (P_7) and NDB-3 (P_8). The genotypes were crossed in the all possible combinations, excluding reciprocals to develop 28 hybrid combinations. The 28 Hybrids along with parents were evaluated for two successive years in 2016-17 and 2017-18 *kharif* season in Randomized Block Design with three replications. The crop was planted in rows spaced at 1.5 x 3.0 meters apart with a plant to plant spacing of 75 x 50 (cm). The analysis of heterosis was done over better parent and standard variety for days to 50% flowering, plant height (cm), number of

AI QUAD CAMERA
REDMI NOTE 8 PRO

Exploitation of heterobeltiosis and economic heterosis for horticultural yield, and its attributes and biochemical traits in pumpkin (*Cucurbita moschata* Duch. ex. Poir) under salt affected soil

Vimlesh Kumar*, D. P. Mishra, G. C. Yadav and Satish Yadav

Department of Vegetable Science, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad 224 229, India

Pumpkin crop can be improved by exploitation of heterosis. This study was carried out during three different seasons, *Kharif*, 2015 (E_1), *Rabi* 2015–16 (E_2) and summer-season, 2016 (E_3) in Eastern Uttar Pradesh, India. The objective was to find out the magnitude of heterobeltiosis, economic heterosis and suitable cross-combination for higher quality fruit yield in pumpkin. Fifteen F_1 hybrids were developed through diallel mating design of six parental lines excluding reciprocals. The evolution of hybrids revealed significant heterobeltiosis as well as economic heterosis for all the traits in all three seasons independently (E_1, E_2 and E_3) and combined. Crosses $P_1 \times P_5$, $P_4 \times P_6$ and $P_1 \times P_2$ may be exploited as commercial hybrids for profitable yield in pumpkin. Significant heterobeltiosis and economic heterosis indicates the importance of heterosis breeding for the developing high yield hybrids.

Keywords: Diallel mating, fruit yield, heterobeltiosis, pumpkin, β-carotene.

PUMPKIN (*Cucurbita moschata* Duch. ex. Poir), originated in central Mexico and is one of the most important vegetable crops of the family Cucurbitaceae grown throughout the world. It provides better nutrition to consumers and higher returns to farmers. Pumpkin is a herbaceous annual, sexually propagated vegetable with chromosome number $2n = 2x = 40$.

Based on commercial significance, the cultivated *Cucurbita* sp. ranks among the 10 leading vegetable crops worldwide. China and India lead the world production and other major producers are the US, Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey. The three economically important species, *Cucurbita pepo*, *C. moschata*, and *Cucurbita maxima* are highly polymorphic in fruit characteristics, inspiring much research in their genetics, although most such studies have been in *C. pepo* and *C. maxima*. The colour of pumpkin is due to orange pigments. The main nutrients are lutein and both α- and β-carotene, the latter of which is a precursor of vitamin A. Pumpkins are versatile for cooking. Most parts of the pumpkin are edible, including fleshy shell, seeds, leaves and even flowers. In the United States and Canada, pumpkin is a popular Halloween and Thanksgiving staple. Pumpkin purée can be frozen for later use. Pumpkin is relatively high in energy and carbohydrates and a good source of vitamins, especially high caretenoid pigments and minerals. It may certainly contribute to the nutritional status of people, particularly the vulnerable groups, with respect to vitamin A requirement. Night-blindness is a serious problem in South Asian countries. Encouraging the masses to consume more pumpkin can easily solve the problem.

Pumpkin crop can be improved by assessing the genetic variability and exploitation of heterosis. Because of the monoecious nature of the crop, large flower size, ease of pollination, high proportion of fruit set of pollinated female flowers, large number of seeds per fruit and low seed rate required per unit area, pumpkin is highly amenable for heterosis breeding. During the last three decades considerable studies have been done on hybrid vigour in pumpkin and a high amount of heterosis has been reported[1–6]. Several hybrids have been released by public and private sectors for its commercial cultivation. The area under F_1 hybrids is growing fast, which has helped to enhance the productivity and production of this crop.

The present study was carried out at the main experiment station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (UP), India, during *Kharif*, 2015 (E_1), *Rabi* 2015–16 (E_2) and *Zaid* (E_3) of 2016. The experimental farm falls under humid subtropical climate and is located between 24.47° and 26.56°N lat and 82.12° and 83.58°E long at an altitude of 113 m amsl. The experimental farm had saline alkali soil with pH above 8.

The experimental materials comprised of six promising and diverse inbreds and varieties of pumpkin selected on the basis of genetic variability from the germplasm stock maintained in the laboratory. The selected parental lines, i.e. Narendra Upkar (P_1), NDPK-120 (P_2), Narendra Agrim (P_3), NDPK-39-2 (P_4), Kashi Harit (P_5) and NDPK-11-3 (P_6) were raised and crossed in all possible combinations, excluding reciprocals, during *Zaid*, 2015 to get 15 F_1 hybrid seeds for the study of heterobeltiosis and economic heterosis.

The experiments were conducted in randomized block design (RBD) with three replications to assess the performance of 15 F_1 hybrids and 6 parents. The treatments were planted in rows spaced 3 m apart with a plant to plant spacing of 0.5 m. The seeds were sown on 23 July 2015, 7 November 2015 and 26 March 2016 for *Kharif*, *Rabi* and *Zaid* crops respectively. All recommended agronomic practices and plant protection measures were followed.

*For correspondence. (e-mail: vimilesjkumaryadav@gmail.com)

60 61

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(4): 2599-2603
Received: 15-05-2018
Accepted: 20-06-2018

Vipin Kumar Maurya
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Gulab Chand Yadav
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Aman Kumar
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Devesh Tiwari
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Sriom
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Vipin Kumar Maurya
Department of Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, India

Estimation of direct selection parameter in okra [*Abelmoschus esculentus* (L.) Moench]

Vipin Kumar Maurya, Gulab Chand Yadav, Aman Kumar, Devesh Tiwari and Sriom

Abstract
The experiment was conducted at Main Experimental Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Kharif*, 2016 in Randomized Block Design with three replications using thirty genotypes of okra collected from different sources to study the correlation and path coefficients analysis at phenotypic and genotypic levels for different quantitative characters. Characters like marketable fruit yield per plant (0.8522), unmarketable fruit yield per plant (0.7458), number of fruits per plant (0.7449), plant height (0.7204), days to 50% flowering (0.5720), days to first fruit harvest (0.5482), crop duration (0.5330) and fruit length (0.4370) have positive significant and desirable association with fruit yield. Thus there is an ample scope for improving characters through direct selection. Marketable fruit yield per plant (0.6192), unmarketable fruit yield per plant (0.4635), number of fruits per plant (0.0670) and days to first fruit harvest (0.0667) were identified as most important traits which had positive direct effect on total fruit yield per plant while, the negative direct effect on yield by rest of the dependent traits were very low.

Keywords: estimation, parameter, okra, *Abelmoschus esculentus*

Introduction

Okra is the most traditional and popular vegetable in India and it is extensively cultivated in summer and rainy season. It is one of the important vegetable crops which are grown throughout the tropical, subtropical and temperate parts of the world. It has been grown commercially in India, Turkey, Iran, Western Africa, Yugoslavia, Bangladesh, Afghanistan, Pakistan, Burma, Japan, Malaysia, Brazil, Ghana, Ethiopia, Cyprus and the Southern United States. Okra [*Abelmoschus esculentus* (L.) Moench 2n = 2x=130] is one of the important member of the family Malvaceae. Okra is an African word and is native to northern Africa including the area of Ethiopia and Sudan. It is a summer and rainy season crop and is widely cultivated from tropics to sub tropics (Kochar, 1986) [6].

Okra (*Abelmoschus esculentus* L.) is probably an amphidiploids (allotetraploid) derived from *Abelmoschus tuberculatus* (2n = 58), a wild species from India, and a species (*Abelmoschus ficulneus* (L.) Wight and Arn. ex Wight) with 2n = 72 chromosomes. Another edible okra species are *Abelmoschus caillei* (A. Chev.). Stevels occurs in the humid parts of West and Central Africa. There are strong indications that *Abelmoschus caillei* is amphidiploids with *Abelmoschus esculentus* being one of the parental species. The lowest chromosome number 2n=56 reported in *Abelmoschus angulosus* (Ford, 1938) whereas, the highest chromosome number 2n=196 reported in *Abelmoschus manihot* var. *Caillei* (Singh and Bhatnagar, 1975 Siemonsma, 1982a, 1982b) [11, 9, 10].

Largest area and production is in India followed by Nigeria in the world. India ranks first in the world with 72 per cent of the total world production of okra. In India the total area covered under okra is 0.51 million hectare with the production of 6.00 million tonnes green fruits in the year 2016-17. Leading okra producing state in India is West Bengal followed by Gujarat and Bihar (Anonymous, 2017) [2].

The information about correlation among different component of yield is necessary for designing efficient plant breeding programme through selection and for simultaneous improvement of yield components. Therefore, such information can be obtained by the studying genotypic and phenotypic correlation coefficient between yield and yield contributing characters.

Path coefficients analysis is helpful in portioning the observed correlation coefficient into direct and indirect effect and there effective use in selection programme.

61

REDMI NOTE 8 PRO
AI QUAD CAMERA

59

International Journal of Chemical Studies 2018; 6(4): 235-237

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2018; 6(4): 235-237
© 2018 IJCS
Received: 06-05-2018
Accepted: 11-06-2018

Maneesh Pandey
Department of Vegetable Science
NDUA&T, Kumarganj,
Faizabad, Uttar Pradesh

GC Yadav
Department of Vegetable Science
NDUA&T, Kumarganj,
Faizabad, Uttar Pradesh

Genetics of yield and its contributing traits of brinjal (*Solanum melongena* L.)

Maneesh Pandey and GC Yadav

Abstract
The study on genetic components of variation revealed that the importance of non-additive systems operating in inheritance of yield and its important components. Degree of dominance was in range of over dominance range for all the characters and close to complete dominance for plant height. The traits *viz.* days to 50% flowering, days to first fruit harvest, average fruit weight, harvest duration and fruit yield per plant, exhibited non significant environmental effect. For days to 50% flowering, days to first fruit harvest, average fruit weight, harvest duration and fruit yield per plant dominant genes were more frequently distributed in the parents. The result suggested preponderance of dominance gene in the expression of traits studied. Therefore, heterosis breeding approach might be advantageous rather than selection to develop superior hybrids for high fruit yield in brinjal.

Keywords: Binjal, genetics, gene action, brinjal, additive

Introduction
Among Solanaceous vegetables, brinjal (*Solanum melongena* L.) is one of the important crops. It is commercially grown in both temperate and tropical regions of the world mainly for its immature fruits as culinary vegetables. Indian collections havemarked diversity in brinjal, as India is the primary centre of origin. (Vavilov, 1931 and Bhaduri, 1951) [6, 8]. Less attention has been paid by the researchers for the development of brinjal cultivars with better fruit quality and as per market preference. The local landraces were have not been fully utilized in anygenetic improvement programme such as selection and hybridization. In brinjal improvement programme, it is very imperative to know the nature and magnitude of gene action and also to know the combining ability of parental lines. In brinjal, the information generated in the breeding process can be used to understand the magnitude of heterosis. However, gene action of different yield and flowering traits has been reported by Chadha *et al.*, (1990) [9]. Due to gene and environment interactions, direct selection in brinjal is not successful. Knowledge of the gene action for targeted traits under selection is most important component of breeding strategy. Hence, a present study on gene action in brinjal is performed to estimate the genetic component, which will be helpful to formulate the future breeding strategies of brinjal.

Methods & Materials
Field experiment was conducted at (MES) Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) India. The materials for the present investigation comprised of 8 divers genotype of brinjal viz.; Siliguri (P_1), Mukta Kesi (P_2), Pant Rituraj (P_3), NDW-White-1 (P_4), Panjab Sadabahar (P_5), NDB-S-1-1 (P_6), KS-224 (P_7) and NDB-3 (P_8). Eight inbred differing in growth habit, fruit and yield characters were selected as parents and were crossed in a diallel fashion excluding reciprocals. The experimental materials comprising 36 treatment *viz.*; 8 parents and 28 F_1s were sown in Randomized Block Design with three replications. Observations were recorded on eight competitive plants in each of parents and F_1's for 5 characters viz.; days to 50% flowering, days to first fruit harvest, average fruit weight (g), harvest duration (days) and yield per plant (kg). The data were subjected to analysis of variance (Panse and Sukhatme, 1967) [10], diallel cross analysis (Hayman, 1957, Jinks and Hayman, 1953) [11, 3] for analytical approach.

Correspondence
Maneesh Pandey
Department of Vegetable Science
NDUA&T, Kumarganj,
Faizabad, Uttar Pradesh

59

REDMI NOTE 8 PRO
AI QUAD CAMERA

60 (60)

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1606-1609

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1606-1609

Rohit Kumar Bajpai
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Vishal Tripathi
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Devraj Singh
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Prateek Kumar
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Rohit Kumar Bajpai
Department of Vegetable Science
N. D. University of Agriculture and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Assessment of genetic variation for growth and economic traits among the genotypes of tomato [*Solanum lycopersicum* (Mill.) Wettsd.]

Rohit Kumar Bajpai, GC Yadav, Vishal Tripathi, Devraj Singh and Prateek Kumar

Abstract
The present study was conducted with the objective to assess the extent of variability among the genotypes of tomato. The experimental material comprising forty six genotypes were evaluated during *Rabi* season of 2014-15. The experiment was conducted in randomized complete block design with three replications and observations were recorded on yield and quality attributes. The analysis of variance revealed that wide ranges of variation were found among the genotypes for all the traits. The estimates of phenotypic coefficients of variation (PCV) were higher than genotypic coefficients of variation (GCV) for all the characters. The estimates of high PCV as well as GCV were observed for number of locules per fruit (25.27 and 24.42) and plant height (21.12 and 20.66), while the high PCV (20.33) was noted for Pericarp thickness. High heritability coupled with high genetic advance in percent of mean was estimated for plant height (95.69 and 41.64), number of locules per fruit (78.67 and 40.96), primary branches per plant (80.67 and 29.73), number of fruits per plant (89.51 and 23.50) and fruit circumference (82.37 and 22.63), which showed ample scope of improvement in these traits through selection.

Keywords: Tomato, PCV, GCV, heritability and genetic advance

Introduction
Tomato (*Solanum lycopersicum* (Mill.) Wettsd.), 2n=2x=24 is one of the most versatile vegetable crop grown throughout the world because of its wider adaptability, high yielding potential and suitability for uses either fresh or processed as the consumers. The red pigment (lycopene) in tomato is now being considered as the world's most powerful natural antioxidant. Therefore, tomato is one of the most important "protective foods" because of its special nutritive value.

Keeping in the potentiality of this crop, there is a need for improvement and to develop varieties suited to specific agro-ecological conditions and also for specific end use. A thorough knowledge regarding the amount of genetic variability existing for various characters is essential for initiating the crop improvement programme. May research workers such as Ahmed *et al.* (2006), Dhar and Sharma (2012) and Prema *et al.* (2011) also worked on the same theme? But the estimates of coefficients of variation, heritability and genetic advance varied with environmental situation and genetic materials used under study therefore, the present experiment was conducted with the objective to estimate the extent of variability present in the available germplasm and the degree of inheritance of the traits to adjudged the expected gain after selection.

Materials and Methods
The experiment was conducted during *Rabi*, 2014-2015 at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology Narendra Nagar (Kumarganj), Faizabad (U. P.). Geographically this area falls under humid sub-tropical climate and is located in between 24.47° and 26.56° N latitude and 82.12° and 83.98° E longitude at an altitude of 113 m above the mean sea level in the Genetic alluvial plains of Eastern Uttar Pradesh.

The experiment was laid out in Randomized Block Design with three replications to assess the performance of 46 genotypes of tomato including three check varieties H-24, H-86 and DVRT-2 taken from IIVR, Varanasi. Seed were sown in nursery bed on 07 October 2014 and 31 days old healthy seedling were transplanted in the experimental field on 07 November 2014 in two row of 4.5 m length with inter and intra row spacing of 60 cm x 45 cm respectively. Fertilizer @ 120kgN: 80kgP_2O_5: 50kg K_2O/ha were applied to the crop.

63

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

Studies on genetic variability, heritability and genetic advance in bitter gourd (*Momordica charantia* L.)

Deepak Maurya, VB Singh, GC Yadav and Veerendra Kumar

Deepak Maurya
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

VB Singh
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Veerendra Kumar
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Deepak Maurya
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Abstract
The experiment was conducted in randomized block design with three replications at the Main Experiment Station of the Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, during the summer season 2017 to evaluate the genetic variability, heritability and genetic advance in available genotype. Observations recorded on twelve quantitative characters.

Analysis of variance revealed that the genotypes evaluated differed significantly among all the treatment for all the twelve traits. The PCV (phenotypic coefficient of variation) were higher than corresponding GCV (genotypic coefficient of variation), it reveals that variation is due to genotypes as well as environmental factors. The estimates of genotypic as well as phenotypic coefficient of variability were observed higher for no. of fruit per plant followed by fruit yield per plant, vine length and node no. of first staminate flower, fruit length whereas, average fruit weight, node number to anthesis of first pistillate flower, and were moderate coefficient of variability. High estimates of heritability were observed for all the character except days to anthesis of first pistillate flower, days to anthesis of first staminate flower, node no. of first pistillate flower, which indicated moderate heritability, while days to first fruit harvest and fruit diameter indicated low heritability. High estimates of genetic advance in per cent of mean recorded for no. of fruit per plant followed by fruit yield per plant, vine length, fruit length, node number to anthesis of first staminate flower, average fruit weight, while no. of nodes per vine and showed moderate genetic advance in per cent of mean.

Keywords: Studies, genetic variability, heritability, genetic advance, bitter gourd

Introduction

Bitter gourd (*Momordica charantia* L.; 2n=2x=22) is one of the important commercial cucurbitaceous vegetable cultivated in India. It is also known as bitter melon, bitter gourd, bitter cucumber, bitter squash, balsam pear, karela, cassilla and maiden apple (Morton, 1967) [13].

The term "cucurbits" is given by Hyde Bailey for cultivated species of family Cucurbitaceae. Bitter gourd (*Momordica charantia* L.) belongs to the family Cucurbitaceae, genus *Momordica* Family Cucurbitaceae includes about 118 genera and 825 species. *Momordica* is a large genus with approximately 80 known species of annual and perennial climbers of which *Momordica charantia* L. is widely cultivated. The other species grown for edible fruits are *M. cochinchinensis* (giant spine gourd or kakrol), *M. dioica* (kartoli), *M. tuberose* and *M. balsamina* (balsam apple). The wild species *M. charantia* var. *abbreviata* of Asia is perhaps the proginator of the cultivated bitter gourd.

The bitterness in bitter gourd is due to momordicine (momordicosides-glycosides of tetracyclic triterpinoids with cucurbitane skeleton) an alkaloid, which is different from cucurbitacins present in other cucurbits. It is bitter to taste, the Karela juice (Bitter Gourd) is abundant amount of essential nutrients. Not only is it highly nutritional, in addition to, considered a wonderworking of health drink. Karela juice has innumerable health benefits. It is an essential tonic for diabetic patients. Not only patients, but in fact, everyone can get some or the other benefit out of this juice. The immature fruits and tender vine tips are used in a variety of culinary preparations. The fruits are soaked in salt water to remove of their bitterness and then boiled, fried or pickled.

The fruit of bitter gourd is higher nutritional value compared to other cucurbits except vitamin C. Fruits are considered as a rich source of vitamins and minerals and 88 mg vitamin C and 210 IU vitamin A per 100 g. Fruits are used after cooking and delicious preparations are made after stuffing and frying. The vine tips are an excellent source of vitamin A. The medicinal value of the gourd in the treatment of infectious diseases and diabetes is attracting of scientists worldwide

63

62

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 388-392

Correlation and path coefficient analysis for yield and horticulture traits in different genotypes of Colocasia (Colocasia *esculenta* var. *antiquorum* (L.) Schott)

Manvendra Singh and GC Yadav

Manvendra Singh
Research Scholar, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Assistant Professor, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Manvendra Singh
Assistant Professor, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Abstract
Correlation and path coefficient analysis studies conducted in forty diverse genotypes of taro with objective to know association among character viz., Days to sprouting, length of leaf (cm), width of leaf (cm), girth of plant (cm), petiole length (cm), sheath length (cm), height of Plant (cm), length of cormels(cm), girth of cormels(cm), number of cormels/plant, weight of cormels/plant(g), length of corm (cm), girth of corms (cm), weight of corms/plant (g),dry matter (%), yield/plant(g). Present study revealed that the trait yield/plant had significant and positive phenotypic and genotypic correlation with Weight of cormels per plant(g), weight of corms per plant (g), number of cormels per plant and dry matter (%). Inter relationship study revealed that for improvement of taro weight of cormels/plant (g), weight of corms plant, girth of cormels (cm) and dry matter (%) at phenotypic level. Path coefficient analysis revealed by weight of cormels per plant followed by weight of corms per plant, length of leaf (cm), dry matter (%), girth of cormels per plant (cm), days to sprouting. exhibited greater direct effect on tuber yield p/plant (g). Therfore, therse character appear to be the most important traits for colocasia improvement programme.

Keywords: Colocasia (*Colocasia esculenta* var. antiquorum), Tuber yield/plant (g), Correlation and path analysis

Introduction
Taro (*Colocasia esculenta* var. antiquorum) is one of the oldest and most important tuber crop. It is also known as eddoes type taro, arvi and ghuia. It is grown mostly as staple or subsistence crop throughout the tropics and subtropics.
The corms and cormels are mostly used as vegetables or as subsidiary food after roasting, baking or boiling. Young leaves and petioles are widely consumed as vegetable. The corms and cormels are rich in starch which contains 17-25 percent amylase. Its flour is considered good baby food because its starch is easily digestible. It helps in constipation problems and supplements iron (Onwueme, 1999). The nutritive value of colocasia per 100g of corms and cormels are moisture 73.1g, Carbohydrate 21.1g, Protien 3.1g, Fat 0.1g, β-carotene 24 µg, Thiamine 0.09mg, Riboflavin 0.03mg, Calcium 40mg, and Iron 1.7mg which can be used as supplements of these nutrients.
The corms are acrid due to presence of calcium oxalate crystals. However, it has got a very good potential as an important tuber crop because of its higher yield potential and better keeping quality. In addition to this, it has got very good medicinal values too. Various parts of the plant are also used in traditional medicine practice (Tsitsiringos, 2002). The juice of the leaves is used against colic and constipation, the acrid juice extracted from leaf stalk is astringent and styptic. The corm is mild lucrative and diuretic. It is generally used against piles, constipation and dropsy in the form of gruel. The ash of the corm is used as antihelminthic, mixed with honey, and it is applied in the aphthus condition of the mouth.

Material and Method
The experimental were comprised of forty genotype collected from All India Coordinate Research on Tuber Crops. The experiments were carried out at two location i.e. NDUAT Kumarganj, Faizabad, UP and Farmer' s field Belakhra, Faizabad, UP for two consecutive seasons i.e. 2015 and 2016 in the randomized block design with three replications. Cormels of each genotype was planted in the month of March at inter and intra row spacing of 60 cm having plot size of: 2.40m x 1.80 m. The standard packages of practices were followed to raise the crops was harvested in November.

62

REDMI NOTE 8 PRO
N-QUAD CAMERA

64

International Journal of Chemical Studies 2018; 6(6): 2567-2570

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(6): 2567-2570
© 2018 IJCS
Received: 09-09-2018
Accepted: 13-10-2018

Devesh Tiwari
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Aman Kumar
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Vipin Kumar Maurya
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Devraj Singh
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Devesh Tiwari
Department of Vegetable Science, NDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Genetic variability, heritability and genetic advance in brinjal (*Solanum melongena* L.)

Devesh Tiwari, GC Yadav, Aman Kumar, Vipin Kumar Maurya and Devraj Singh

Abstract
The present investigation conducted at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj) Ayodhya involving 40 diverse genotypes of brinjal (*Solanum melongena* L.) in Randomized Block Design replicated thrice during *kharif-Rabi*-2017 to estimate the genetic variability, heritability (bs) and genetic advance in present of mean for planning the leading strategy in the available germplasm of brinjal. The observations were recorded on twelve quantitative traits *viz.* days to 50% flowering, plant height (cm), primary branches per plant, days to first fruit harvest, crop duration, fruits per plant, fruit length (cm), fruit circumference (cm), average fruit weight (g), marketable fruit yield per plant (kg), unmarketable fruit yield per plant (kg) and total fruit yield per plant (kg) and qualitative traits viz. fruit colour, fruit shape and calyx colour. The analyses of variance revealed that mean sum of squares due to genotypes were highly significant for all the traits indicating ample variation among the genotypes. Whereas, the higher magnitude of coefficient of variation at phenotypic level observed for fruits per plant (53.98%) followed by average fruit weight (43.36%), fruit circumference (34.63%), unmarketable fruit yield per plant (30.73%), marketable fruit yield per plant (26.64%) and total fruit yield per plant (23.99%). However, low variability recorded in the case of crop duration (5.62%). High heritability (>75) coupled with high genetic advance (>30) was observed for most of the traits except days to 50 per cent flowering, plant height, days to first fruit harvest and crop duration which indicated opportunity for selection response in available germplasm of eggplant.

Keywords: brinjal or *Solanum melongena* L. mean performance, PCV, GCV, heritability

Introduction

Brinjal or eggplant (*Solanum melongena* L.) is one of the most important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. It is grown in the tropics and subtropics of India and other parts of the world. It is called brinjal in India and aubergine in Europe.

It is undoubtedly of Indian origin and has been cultivated for long time (Thompson and Kelly, 1957) [16]. Vavilov (1951) suggested China as the centre of origin. Wild brinjal types are available in southern coastal area of Africa.

Brinjal is being cultivated in India over an area of 0.73 million hectares with an average annual production of 12.51 million tonnes and productivity of 17.06 million tonnes/hectares. It is widely distributed in Orissa, Bihar, Karnataka, West Bangal, Andhra Pradesh, Maharashtra and Utter Pradesh. In Uttar Pradesh, brinjal is being cultivated on an area of 4.10 lakh ha with annual production of 136.16 lakh tonnes (Anonymus. 2017) [1].

Brinjal an annual herbaceous plant has inflorescence with a cluster of 2-5 flowers. Both solitary and cluster type flowering are found. Heterostyly is common feature. Four types of flowers have been identified depending upon the length of style, these are long styled with large ovary, medium styled with medium ovary, pseudo-styled with rudimentary ovary and true short styled with very rudimentary ovary. Fruit setting in long styled is 70-85% while medium styled varies from 12-15%. Brinjal is usually self-pollinated but the extent of cross-pollination as high as 29 per cent has been reported. It is consider as often cross pollinated and out crossing takes place with the help of insects. Flower emerges 40-45 days after transplanting. Anthesis occurs at 6-8 am in August-September and usually 9:30-11:15 am in December-January. Stigma receptivity is highest during anthesis *i.e.* flower opening. Anthers usually dehisce 15-20 minutes after the anthesis.

64

AI QUAD CAMERA
REDMI NOTE 8 PRO

Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 293-295

Character association and path coefficient analysis of yield and its contributing traits in tomato (*SolanumLycopersicon Mill.*)

Prateek Kumar, CN Ram, G.C. Yadav, Rohit kumar bajpai, Devraj Singh and Shiv Prakash Shrivastav

Prateek Kumar
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

CN Ram
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

G.C. Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Rohit kumar bajpai
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Devraj Singh
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Shiv Prakash Shrivastav
Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Correspondence
Prateek Kumar
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Abstract
Thirty genotypes including three check varieties (Determinate Punjab Chhuhara, Indeterminate Pusa Ruby and Indeterminate NDT-8) of tomato (*Solanum Lycopersicon Mill.*) were assessed to work out the association of different yield traits, direct and indirect effects of their various attributes on yield per plant. The most important trait fruit yield per plant had highly significant and positively correlated with marketable fruit yield per plant (0.82), number of fruits per plant (0.61), average fruit weight (0.26) and primary branches per plant (0.15). Pericarp thickness had highly significant and negatively correlated with days to 50 per cent flowering (-0.26). Number of fruit length (0.75) and locules per fruit (0.74) were highly significant and positively correlated with diameter of fruit. Number of fruits per plant was highly significant and negatively correlated with average fruit weight (-0.43). The higher direct effect showed by number of fruits per plant (0.55), followed by average fruit weight (0.49). Number of marketable fruits per plant showed highly indirect and positively effect *via* marketable fruit per plant (0.34), fruit length (0.14). While average fruit weight (-0.24) and total soluble solids (-0.15) showed negatively indirect effect *via* number of fruits per plant.

Keywords: Tomato (*Solanum Lycopersicon Mill.*), Character association, path analysis and fruit yield

Introduction

Vegetables are valuable source of carbohydrates, protein, vitamins, minerals, fat, elemental salts and crude fibers. In addition to nutritional richness, vegetables add a variety of taste, colour and texture to the diets. India is credited as the second largest producer of vegetables in the world next only to China. Because of varied agro-climatic conditions in India, a large number of vegetable crops are grown here and a great deal of research work has been conducted in the disciplines of vegetable breeding, production technology, plant protection, seed production and post harvest technology. Number of processed items are prepared on large scale for consumption as well as for export purposes. All the species of tomato are native to Western Southern America (Rick, 1976). Tomato is used as fresh vegetable and is also very important for processing purposes like soup, ketchup, sauce, concentrate, puree, juice, chutney etc. Unripe green fruits are used for preparation of pickles and chutney. Tomatoes are important source of lycopene (an antioxidant), ascorbic acid and ß-carotene and valued for their colour and flavour. It is rich source of mineral, vitamins and organic acids essential amino acid and dietary fibers. It is rich source of vitamin A and C. Tomato also contains minerals like iron, phosphorus. Tomato fruits are eaten raw or cooked. It supplies vitamin C and adds variety of colours and flavours to the food. It has many other uses; tomato seeds contain 24 per cent oil used as salad oil and in the manufacture of margarine. Tomato is known for its outstanding nutritive value, which is given as; per 100 g of edible part of tomato fruits contain- 93.1g moisture, 3.6g carbohydrate, 1.9 g protein, 0.1g fat, 0.6g minerals, 0.7g fibers, 320 I.U. vitamin A, 31mg vitamin C (Ascorbic acid), 36 mg phosphorus, 15 mg magnesium, 45.8 mg sodium, 38 mg chlorine, 114 mg potassium, 1.8 mg iron, and 192 mg. b-carotene etc. Tomato is also rich in medicinal value. The pulp and juice are digestible, a promoter of gastric secretion and blood purifier. It is said to be useful against cancer of the mouth and sour mouth, etc. It is one of the best vegetables which keep our stomach and intestine in good order. It is one of the most popular and widely cultivated vegetable throughout the world and ranking second in importance after potato in many countries including India (Anonymous, 2013-14). The total area of world in tomato under cultivation is 4.58 m ha and total production is 150.51 million tonnes with 32.8 tonnes per hectare productivity. In India, total area is 0.88 million hectare and production is 18.23 million tonnes with 20.7 tonnes per hectare productivity,

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 771-775

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 771-775
Received: 21-01-2018
Accepted: 23-02-2018

Vivek Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

CN Ram
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Sriom
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Shiv Prakash Shrivastav
Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

KK Bhargav
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Akshay Jain
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Sriom
Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Character association and their direct and indirect relationship between yield and its contributing traits in taro (*Colocasia esculenta* L. *var.* Antiquorum)

Vivek Yadav, CN Ram, GC Yadav, Sriom, Shiv Prakash Shrivastav, KK Bhargav and Akshay Jain

Abstract
Twenty seven genotypes including two check varieties (NDC-1 and NDC-2) of taro (*Colocasia esculenta* L. *var.* Antiquorum) were assessed to work out the association of different yield traits, direct and indirect effects of their various attributes on yield per plant. The yield per plant had shown significant and positive correlation at phenotypic level with weight of cormels per plant (0.695), number of cormels per plant (0.595), weight of corms per plant (0.451), day to sprouting (0.293). However, this character had negative and significant association with plant height (-0.364), petiole length (-0.303), leaf width (-0.287), leaf length (-0.296). Among other traits days to sprouting had positive and significant association with number of cormel per plant (0.343), yield per plant (0.293), weight of cormels per plant (0.285), at phenotypic level. At phenotypic level weight of cormels per plants (0.543) followed by weight of corm per plant (0.499), number of cormels per plant (0.217), length of leaf (0.183), and petiole length (0.072) exerted high positive direct effect on total yield per plant. Length of leaves had negative and significant association with yield per plant (-0.296) which was mainly due to indirect effects by weight of cormels per plant (-0.130) and width of leaf (-0.121). Petiole length *via* indirect effects of weight of cormels per plant (-0.149) and plant height (-0.101) was showed negative and significant association with yield per plant (-0.303).

Keywords: taro (*Colocasia esculenta* L. *var.* antiquorum), character association, path coefficient analysis and yield per plant

Introduction

Tuber crops, the third most important food crop constitute staple and or important subsidiary food for about a fifth of people of the world considering the adaptability and suitability to the varied climate, more attentions need to be focused on tuber crops. Among tuber crops, Taro (*Colocasia esculenta* var. Antiquorum) is one of the oldest and most important tuber crop. It is also known as eddoes type taro, arvi and ghuian. It is grown mostly as staple or subsistence crop throughout the tropics and subtropics. Although this crops is not treated as economically important and was often considered as poor man's crop. Which is most extensively consumed low income by the group in the rural areas. However, in the recent part, economic importance of this crop has region up considerably and therefore the availability of quality planting materials has become an important agenda for taro crops growers.

Tropical root and tuber crops have been instrumental in filling the hungry stomach of millions of small holder operators since ages. In any places, they served as the alternate food source for livelihood security. Today when the over ground food crops are facing the production challenge due to a likely vegetative impact of climate change hopes are now being pinned on root and tuber crops since they are less likely to suffer from such impact.

Colocasia belongs to the monocotyledonous family Araceae whose members are known as aroids (Van Wyk, 2005) [5]. Taro is one of the most important edible species under the genus *Colocasia* and usually they are polyploidy, but mostly found triploid in nature with chromosome no. 2n=3x=42. India to Southern Asia is the centre of origin of *colocasia* from where it has traveled east to all the Island of Occeania, Phillipines, China and Japan. Although, India is known as native of taro. Africa ranks first in area and production of *Colocasia* followed by Asia. In India, it is mainly cultivated in Eastern and Southern States. Faizabad, Varanasi, Sitapur, Sultanpur and some parts of Jhansi.

The corms and cormels are mostly used as vegetables or as subsidiary food after roasting, baking or boiling. Young leaves and petioles are widely consumed as vegetable. The corms

REDMI NOTE 8 PRO
AI QUAD CAMERA

49 50

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1455-1459

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1455-1459

Vimlesh Kumar
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

D. P. Mishra
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

G.C. Yadav
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Satish Yadav
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Sandeep Kumar
Department of Entomology, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Shivam
Department of Extension Education, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Harikesh
Department of Agronomy, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Correspondence
D. P. Mishra
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, (U.P.), India.

Perse performance of pumpkin genotypes for growth and yield traits under Eastern Uttar Pradesh Conditions

Vimlesh Kumar, DP Mishra, GC Yadav, Satish Yadav, Sandeep Kumar, Shivam and Harikesh

Abstract
The present investigation was conducted with the using of fifteen F_1 hybrids developed by the using of diallel mating of six parents excluding reciprocals. The hybrids and parents were evaluated consecutively different three seasons during 2015-16 and pooled analysis was worked out. The observations were recorded on fourteen quantitative traits *viz.*, days to first female flower anthesis, days to first male flower anthesis, node number to first male flower appearance, node number to first female flower appearance, days to first fruit harvest, vine length (m), internodal length (cm), number of primary branches per plant, fruit weight (kg), number of fruits per plant, equatorial circumference of fruit (cm), polar circumference of fruit (cm), flesh thickness (cm), fruit yield per plant (kg). The analysis of variance revealed that mean squares due to genotypes found significant for all the quantitative traits indicating wide range of variability among the genotypes (hybrids and parents). The hybrids *viz.*, $P_3 \times P_5$, $P_1 \times P_3$ and $P_1 \times P_2$ were showed earliness for flowering and marketable fruit yield.

Keywords: Fruit yield, diallel, pumpkin

Introduction
Based on commercial significance the cultivated *Cucurbita* sp. ranks among the 10 leading vegetable crops worldwide. China and India lead the world production and other major producers are U.S., Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey (Ferriol and Pico, 2008) [3]. The total area of pumpkin in India is 19,760 hectares whereas, the total production is 0.42 million tonne with productivity 21.25 MT/ha (Annonymous, 2015). Robinson and Decker-Walters (1999) [5] concluded that in genus *Cucurbita*, there are 5 cultivated and 10 wild species. Seshadri and More (2009) [6] also stated that the recent recognition of synonyms and taxonomic changes have reduced the number of *Cucurbita* species to 15 or even less. The five cultivated species are *C. argyrosperma* (earlier *C. mixta*), *C. pepo*, *C. maxima*, *C. moschata* and *C. ficifolia*. In India, pumpkin and squashes were introduced from South America by foreign navigators and emissaries. *Cucurbita moschata* is more widely cultivated than other four cultivated species in our country. Since *Cucurbita moschata* is amenable to hotter climates more than other cultivated species, it is also the most widely grown vegetable throughout the tropics of both hemispheres. Pumpkins, like other squash, are thought to have originated in North America. The oldest evidence, pumpkin-related seeds dating between 7000 and 5500 BC, were found in Mexico.

The color of pumpkin is due to the orange pigments. The main nutrients are lutein and both α and β-carotene, the latter of which generates vitamin A in the body. Pumpkins are very versatile in their uses for cooking. Most parts of the pumpkin are edible, including the fleshy shell, seeds, leaves, and even flowers. In the United States and Canada, pumpkin is a popular Halloween and Thanksgiving staple. Pumpkin purée is sometimes prepared and frozen for later use.

Pumpkin is relatively high in energy and carbohydrates and a good source of vitamins, especially high caretenoid pigments and minerals. It may certainly contribute to improve nutritional status of the people, particularly the vulnerable groups in respect of vitamin A requirement. Night-blindness is a serious problem of South Asian countries. Encouraging the mass people to take more pumpkin can easily be solved the problem.

Materials and Methods
The experiments were conducted in Randomized Block Design (RBD) with three replications to assess the performance of 15 F_1 hybrids and 6 parents (in two seasons (*Kharif* and *Rabi*

50

REDMI NOTE 8 PRO
AI QUAD CAMERA

54 (54)

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
IJCS 2018; 6(2): 2695-2699
© 2018 IJCS
Received: 05-01-2018
Accepted: 08-02-2018

Vimlesh Kumar
Department of Vegetable Science, N.D.U.A. & T. Kumarganj Faizabad, Uttar Pradesh, India

DP Mishra
Department of Vegetable Science, N.D.U.A. & T. Kumarganj Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, N.D.U.A. & T. Kumarganj Faizabad, Uttar Pradesh, India

Umesh Babu
KVK, Sant Kabir Nagar, N.D. U. A. & T. Kumarganj Faizabad, Uttar Pradesh, India

Correspondence
DP Mishra
Department of Vegetable Science, N. D. U. A. & T. Kumarganj Faizabad, Uttar Pradesh, India

Studies on genetic component analysis and gene action for growth, yield and yield attributing traits of pumpkin

Vimlesh Kumar, DP Mishra, GC Yadav and Umesh Babu

Abstract
Fifteen hybrids of pumpkin developed through diallel mating (excluding reciprocals) using six parents were evaluated for three seasons with the objective to know the nature of inheritance of growth and yield attributes. The present study revealed that the both additive and dominance variance were found important in the inheritance of most of the traits, whereas dominance variance were more prominent than the additive variance in all three seasons. Average degree of dominance revealed the presence of over dominance for all traits in all three seasons (E_1, E_2, E_3). Highly significant values of additive ($\hat{D}$) and dominance ($\hat{H}_1$ and $\hat{H}_2$) effects of components were observed for most of the traits studied in all three seasons (E_1, E_2, E_3) except the values of $\hat{D}$ for node number to first male flower appearance, number of primary branches per plant, polar circumference of fruit and intermodal length in all three seasons and for days to first male flower anthesis in E_2, for equatorial fruit circumference in E_1 and E_2 which were found non-significant. In general the proportions of dominant and recessive genes in parents [4 $\hat{D}$ $\hat{H}_1)^{1/2}+\hat{F}$ / (4 $\hat{D}$ $\hat{H}_1)^{1/2}-\hat{F}$] were more than unity with positive $\hat{F}$ value for all the traits in all three seasons except fruit length in Y_2 indicating major contribution of dominant genes.

Keywords: Pumpkin, gene action, yield, non-additive

Introduction

Based on commercial significance the cultivated *Cucurbita* sp. ranks among the 10 leading vegetable crops worldwide. China and India lead the world production and other major producers are U. S. Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey (Ferriol and Pico, 2008). The total area of pumpkin in India is 19,760 hectares whereas, the total production is 0.42 million tonne with productivity 21.25 MT/ha (Annonymous, 2017). Robinson and Decker-Walters (1999) [17] concluded that in genus *Cucurbita*, there are 5 cultivated and 10 wild species. Seshadri and More (2009) [18] also stated that the recent recognition of synonyms and taxonomic changes have reduced the number of *Cucurbita* species to 15 or even less. The five cultivated species are *C. argyrosperma* (earlier *C. mixta*), *C. pepo*, *C. maxima*, *C. moschata* and *C. ficifolia*. In India, pumpkin and squashes were introduced from South America by foreign navigators and emissaries. *Cucurbita moschata* is more widely cultivated than other four cultivated species in our country. Since *Cucurbita moschata* is amenable to hotter climates more than other cultivated species, it is also the most widely grown vegetable throughout the tropics of both hemispheres. Pumpkins, like other squash, are thought to have originated in North America. The oldest evidence, pumpkin-related seeds dating between 7000 and 5500 BC, were found in Mexico.

The three economically important species, *C. pepo*, *C. moschata*, and *C. maxima* are highly polymorphic in fruit characteristics, inspiring much research into their inheritance although most of such studies have been done in *C. pepo* and *C. maxima*. The gene list of *Cucurbita* sp. includes 79 loci for phenotypic/morphological traits and 48 polymorphic allozyme loci along with linkage and gene mapping (Paris and Brown, 2005) [15]. However, information on simply inherited characters documented in the gene list is almost lacking for *C. moschata*, and among the few that have been reported so far are Trifluralin (a herbicide) tolerance controlled by a dominant gene "*T*" (Adeoye and Coyne, 1981) [1], naked kernel (absence of tough seed coat) trait

54

REDMI NOTE 8 PRO
AI QUAD CAMERA

49 52

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3128-3133

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 3128-3133
Journal homepage: http://www.ijcmas.com

Original Research Article

The Effect of Different Planting Dates and Varieties on Yield and Yield Attributes of Potato (*Solanum tuberosum* L.)

Satya Prakash Singh[1], Traloki Singh[2*], G. C. Yadav[3] and A. P. S. Dohare[1]

[1]Krishi Vigyan Kendra Belipar, Gorakhpur – 273011 (UP), India
[2]KVK (ICAR-CAZRI) Kukma, Bhuj, (Raj.), India
[3]Department of Vegetable Science, N. D. University of Agriculture & Technology Kumarganj, Faizabad (UP), India
*Corresponding author

ABSTRACT

The field experiment was conducted for determination of most suitable planting dates for cultivation of potato during *Rabi* season of 2011-12 and 2012-13 at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). Five planting dates (17 October, 27 October, 7 November, 17 November and 27 November) and four varieties (Kufri Ashoka, Kufri Pushkar, Kufri Bahar and Kufri Arun) were arranged in Randomized Block Design with factorial concept, replicated four. Total tuber yield (q/ha), total number of tubers/plant, total number and weight of "A" grade (>75g), "B" grade (50-75g), "C" grade (25-50g) and "D" grade (0-25g) tubers/plant. The result revealed that planting on 17 November produced maximum tuber yield i.e. 391.59 quintal and 404.59 quintal per hectare during 2011-12 and 2012-13, respectively. However, the minimum total tuber yield i.e. 282.61 q/ha and 291.74 q/ha was recorded when planted on 27 November during both the years of investigation. Among the varieties the maximum total tuber yield was obtained i.e. 376.33 quintal per hectare in variety Arun followed by Kufri Pushkar. However the variety Kufri Ashoka and Kufri Bahar found to be at par during 2011-12 and 2012-13, respectively.

Keywords

Potato (*Solanum tuberosum* L.), yield, varieties

Introduction

Potato (*Solanum tuberosum* L.) belongs to family 'solanaceae' is one of the most important vegetable crops grown throughout India. The major state of the country growing potato are Uttar Pradesh, West Bengal, Bihar and Gujarat, however, the maximum productivity of the crop is found in West Bengal followed by Gujarat. Potato plays an important role in Indian diet since multifarious preparations are prepared from it. It is consumed as cooked vegetable and being versatile can be mixed with almost every cooked vegetable. It is also used for making chips, potato powder, French-fries and for the extraction of starch. In some areas, it is often consumed as a substitute of cereals. It is also used as thickener in soups and gravies. Potato starch has molding cast candies, such as jelly bens and gumdrops, as thickening agent in synthetic jellies and ice creams, as dusting agent mixed with powdered sugars, for candy gums, chewing gums etc. Potato is considered a protective food since potato supply a substantial

52

50 53

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3134-3137

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 3134-3137
Journal homepage: http://www.ijcmas.com

Original Research Article

Influence of Different Planting Dates on Late Blight Incidence and Yield of Potato (*Solanum tuberosum* L.)

Satya Prakash Singh[1], Traloki Singh[2*], G. C. Yadav[3] and Shailendra Singh[1]

[1]Krishi Vigyan Kendra Belipar, Gorakhpur- 273011,
[2]KVK (ICAR-CAZRI) Kukma, Bhuj, Gujrat (Raj.)
[3]Department of Vegetable Science, N. D. University of Agriculture & Technology Kumarganj. Faizabad- 224229, India
Corresponding author

ABSTRACT

Field experiment was carried out during 2011-12 and 2012-13 at main experiment station Department of vegetable science, Narendra Dev University of Agriculture and Technology Kumarganj, Faizabad (UP). To evaluate the effects of five planting dates 17 October, 27 October, 7 November, 17 November and 27 November an incidence of late blight (*Phytophthora infestance*) in four potato cultivars Kufri Ashoka, Kufri Pushkar, Kufri Bahar and Kufri Arun during crop season 2011-12 and 2012-13. The maximum incidence of late blight was recorded in variety Kufri Ashoka when planted on 27 November while the minimum incidence was recorded in variety Kufri Arun was early planted on 17 October. The production of potato tubers was obtained i.e. 471.48q. and 487.48q/ha was significantly highest with 17 November planting of variety Kufri Arun during 2011-12 and 2012-13, respectively. Thus, the results revealed that the best time for planting of potato in eastern Uttar Pradesh on 17th November which shifted from 7th November of planting due to climate change.

Keywords

Potato (*Solanum tuberosum* L.), late blight, yield

Introduction

Potato (*Solanum tuberosum* L.) belongs to family 'solanaceae' is one of the most important vegetable crops grown throughout India. Potato plant is very sensitive to climate factors such as temperature and day length, which exert a considerable influence on its growth and development. A temperature of 15-20^{0}C is optimum for sprouting and emergence of tubers. Maximum tuberization taken place a mean temperature of about 20^{0}C. Soil has great influence on yield and quality of the potato tubers. Crop grown on coarse textured (light) soils produces better quality tubers with characteristic shape and bright skin colour, which fetches higher price in the market, however, tuber grown in loamy soils have comparatively better keeping quality than those grown in sandy soils, as the latter become too hot by the time of main and late crops are harvested (Anonymous, 1960).

The criteria for working out the optimum time of planting is that the temperature at planting should be below 32^{0}C, while minimum temperature should be less than 20^{0}C by about 25-30 days after planting and the available growing period with this

53

Journal of Hill Agriculture 9(1): 39-43, January – March, 2018
DOI 10.5958/2230-7338.2018.00007.1

RESEARCH PAPER

Study of genetic variability in cucumber

SHASHANK SHEKHAR SINGH •GC YADAV •KHUSHBOO KATHAYAT

Received: July 24, 2017, Revised: February 6, 2018, Accepted: February 28, 2018

ABSTRACT Twenty three genotypes of cucumber along with two checks (Pant Khira-1 and Pant Khira-3) were studied for extent of genetic variability, character association and path coefficient analysis with respect to yield and yield contributing traits at Vegetable Research Center, NDUAT, Faizabad. Analysis of variance indicated substantial variability among the progenies for all the traits. Highest genotypic and phenotypic coefficient of variation was exhibited by number of fruits per plant (54.22 and 55.93, respectively) and lowest in days to first fruit harvest (8.75 and 10.05, respectively). High heritability with high genetic advance (GA) was observed for fruit yield per plant followed by number of fruits per plant, which is an indicative of greater proportion of additive genetic variance and consequence a high genetic gain from selection. Correlation analysis revealed that number of fruits per plant had significant positive correlation for fruit yield/plant. Path analysis revealed that number of fruits per plant had highest positive direct effect on fruit yield/plant followed by average fruit weight on fruit yield per plant at both genotypic and phenotypic level indicating for greater emphasis on these traits during selection for improvement of yield.

KEYWORDS Cucumber, genetic variability, heritability, genetic advance, correlation, path coefficient

Singh SS[1] • Yadav GC[1] • Kathayat Khushboo[2]

[1]Department of Vegetable Science, Narendra Dev University of Agriculture and Technology, Kumarganj - 224 229, Faizabad, Uttar Pradesh, India
[2]Department of Vegetable Science, College of Agriculture, GB Pant University of Agriculture and Technology, Pantnagar – 263 145, Uttarakhand, India

Shashank Shekhar Singh (✉)
E mail: shashanksiingh@gmail.com

INTRODUCTION

Cucumber (*Cucumis sativus* L., 2n = 2x = 14) is one of the most important member of Cucurbitaceae family, having 118 genera and 825 species. It is thought to be originated from India and China, is considered as secondary center of diversity. In India, cucumber is cultivated in an area of 43000 ha with annual production of 678000 m (Anonymous 2014). The important growing states of India are Arunachal Pradesh, Assam, Haryana, Bihar, Odisha, Punjab, Rajasthan, Uttar Pradesh and West Bengal. It is an ideal summer vegetable crop mainly grown for its edible tender fruits, preferred as salad ingredient, pickles, desert fruit and as a cooked vegetable. Improvement of crop depends on the magnitude of genetic variability in economic characters, therefore, the evaluation and utilization of genetic variability is important for yield improvement programme. The extent of genetic variability in a specific breeding population depends on the genotypes included in it and its selection history. In this regard, it is necessary to survey the available useful variability in the various plant characters. Variation at phenotypic level is the combination of genetic as well as environmental variability, which does not help in effective selection. Hence, the decisive factors primarily rest on genotypic variability or more specifically additive genetic variability on which selection operates. Statistics like coefficient of variation, heritability and genetic advance provide basic information on the variation of a character at phenotypic and genotypic level. A rational choice of characters on which selection is exercised for higher yields requires an understanding of the association of characters with yield and among themselves. Further path coefficient analysis is an efficient tool to elucidate the direct and indirect effect of each character towards yield. Hence, the present investigation was taken up to study the association of yield and its component traits in cucumber.

54 55

International Journal of Agriculture Sciences
ISSN: 0975-3710&E-ISSN: 0975-9107, Volume 10, Issue 7, 2018, pp.-5687-5690
Available online at http://www.bioinfopublication.org/journal.php?opt=&journal=IJP&year=2018&vol=10&issue=7&article=017

Research Article

GENE ACTION STUDIES FOR BIOCHEMICAL TRAITS IN PUMPKIN (*Cucurbita moschata* Duch. Ex. Poir)

KUMAR VIMLESH[1], MISHRA D.P.*[1], YADAV G.C.[1] AND BABU UMESH[2]

[1]Department of Vegetable Science, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh
[2] KVK, Sant Kabir Nagar, Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh
*Corresponding Author: Email-vimleshkumaryadav@gmail.com

Received: April 03, 2018; Revised: April 06, 2018; Accepted: April 07, 2018; Published: April 14, 2018

Abstract- The present experiment was conducted with aim to know the nature of inheritance of biochemical traits *viz.*, ascorbic acid (mg/100g), reducing sugars (%) non-reducing sugars (%), total sugars (%), dry matter content, total soluble solids, β-carotene (mg/100g). The fifteen F_1 hybrids developed through the diallel mating excluding reciprocals with the using of six parents. Highly significant values of additive ($\hat{D}$) and dominance ($\hat{H}_1$ and $\hat{H}_2$) effects of components were observed for most of the traits studied in all three seasons (E_1, E_2, E_3) except the values of $\hat{D}$ for total sugars, reducing sugars and ascorbic acid in all three seasons. Average degree of dominance revealed the presence of over dominance for all traits in all three seasons (E_1, E_2, E_3). The proportions of genes ($\hat{H}_2/4\hat{H}_1$) in the parents were less than 0.25 for all the traits indicating asymmetrical distribution of alleles at loci showing dominance in all three seasons (E_1, E_2, E_3). In general the proportions of dominant and recessive genes in parents [$4\hat{D}\hat{H}_1)^{1/2} + \hat{F}$ / $(4\hat{D}\hat{H}_1)^{1/2} - \hat{F}$] were more than unity with positive $\hat{F}$ value for all the traits in all three seasons indicating major contribution of dominant genes. The ratio of ($\hat{h}^2/\hat{H}_2$) which estimates the number of gene groups revealed that atleast one gene group was involved in the inheritance for total soluble solids during all three seasons. While, for dry matter content, total sugars and reducing sugars exhibited similar number of gene group only during E_2 and rest of traits showed involment of less than one gene group.

Key words- Quality Traits, Pumpkin, B-Carotene.

Citation: Kumar Vimlesh., *et al.*, (2018) Gene Action Studies for Biochemical Traits in Pumpkin (*Cucurbita moschata* Duch. ex. Poir). International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 7, pp.-5687-5690.

Copyright: Copyright©2018 Kumar Vimlesh., *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer:

Introduction

The three economically important species, *C. pepo*, *C. moschata*, and *C. maxima* are showed variation for fruit characteristics, during spining season although much research into their inheritance although most of such studies have been done in *C. pepo* and *C. maxima*. The gene list of *Cucurbita* sp. includes 79 loci for phenotypic /morphological traits and 48 polymorphic allozyme loci along with linkage and gene mapping [1]. In case of *C. moschata* information regarding inheritance of characters documented in the gene list is almost lacking and among the few that have been reported so far are Trifluralin (a herbicide) tolerance controlled by a dominant gene "*T*" [2], naked kernel (absence of tough seed coat) trait controlled by a pair of recessive genes [3] and mottled light and dark green fruit colour, monogenic dominant ("*Mldg*") over dark green fruit [19]. A wide range of expression of the trait "silver leaf mottling" was observed in *C. moschata*although all the reports indicated that this trait showed dominance over non-mottled leaf. Latha and Gopalkrishnan,[4]and a single gene "*M*" [5]. Information on polygenic inheritance of quantitative characters in pumpkin is also meager. for number of seeds/fruit, 100-seed weight and seed size index [6]; over-dominance [7] and dominance [8]. Over-dominance gene action for all the nutritional traits, namely, total soluble solids, carotenoids, ascorbic acid, calcium, and iron content [9] clearly suggested the importance of exploiting heterosis commercially. The color of pumpkin is due to the orange pigments. The main nutrients are lutein and both α and β-carotene, the latter of which generates vitamin A in the body. Pumpkins are very versatile in their uses for cooking. Most parts of the pumpkin are edible, including the fleshy shell, seeds, leaves, and even flowers. In the United States and Canada, pumpkin is a popular Halloween and Thanks, giving staple. Pumpkin purée is sometimes prepared and frozen for later use. Pumpkin is relatively high in energy and carbohydrates and a good source of vitamins, especially high caretenoid pigments and minerals. It may certainly contribute to improve nutritional status of the people, particularly the vulnerable groups in respect of vitamin A requirement. Night-blindness is a serious problem of South Asian countries. Encouraging the mass people to take more pumpkin can easily be solved the problem.

Materials and Methods

The experimental materials for the present study comprised of six promising and diverse inbreds and varieties of pumpkin selected on the basis of genetic variability from the germplasm stock maintained in the Department of Vegetable Science, N.D. University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) India. The selected parental lines i.e. Narendra Upkar (P_1), NDPK-120 (P_2), Narendra Agrim (P_3), NDPK-39-2 (P_4), Kashi Harit (P_5) and NDPK-11-3 (P_6) were raised and crossed in the all possible combinations, excluding reciprocals, during Zaid, 2015 to get 15 F_1 hybrid seeds for the study of character association for fourteen quantitative traits. The experiments were conducted in Randomized Block Design (RBD) with three replications to assess the performance of 15 F_1 hybrids and 6 parents. The treatments were planted in rows spaced at 3.0 meters apart with a plant to plant spacing of 0.5 meter. The seeds were sown on 23th July, 2015 and 7th November 2015, 26th March, 2016 for Kharif, Rabi and Zaid crops, respectively. All the recommended agronomic package of practices and plant protection measures were followed to raise good crop.

REDMI NOTE 8 PRO

43

Journal of Pharmacognosy and Phytochemistry 2017; 6(5): 791-795

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(5): 791-795
Received: 07-07-2017
Accepted: 08-08-2017

Rohit Kumar Bajpai
Department of Vegetable Science, NDUA&T, Kumarganj Faizabad, Uttar Pradesh, India

Yadav GC
Department of Vegetable Science, NDUA&T, Kumarganj Faizabad, Uttar Pradesh, India

Vimlesh Kumar
Department of Vegetable Science, NDUA&T, Kumarganj Faizabad, Uttar Pradesh, India

Correspondence
Rohit Kumar Bajpai
Department of Vegetable Science, NDUA&T, Kumarganj Faizabad, Uttar Pradesh, India

Correlation and path analysis for growth and morpho-economic characters in tomato (*Solanum lycopersicon* (Mill.) Wettsd)

Rohit Kumar Bajpai, Yadav GC and Vimlesh Kumar

Abstract
The study conducted to know the association among different morpho-economical traits of tomato with the using path analysis. The experiment comprising forty six diverse genotypes, grown in randomized block design with three replications. The study revealed that the general, genotypic correlation coefficients were higher than the corresponding phenotypic correlation coefficients suggested a strong inherent relationship in different pairs of the traits. Number of fruits per plant (0.634), plant height (0.382), primary branches per plant (0.255) and fruit length (cm) (0.167) has positive significant and desirable association with fruit yield and selection of these traits would be effective for yield improvement in tomato. Path coefficient analysis revealed appreciable amount of direct positive effect of fruits per plant (1.260) followed by average fruit weight (0.8495).

Keywords: tomato, correlation, path analysis, fruit yield

Introduction

The study of correlation between different characters is essential in improving the efficiency of selection. Correlation coefficient is a measure of the degree of association between the two traits worked out at the same time. Total correlation does not give the true genetic picture of the relationship between two traits in which a breeder is interested, because it includes environmental influence on the covariance between two characters. This component is measured as environmental correlation.The genotypic correlation is essential for assessing the real genetic variation in traits of significance. The basic concepts of correlation was put forth by Galton (1889) and elaborated by Fisher (1918) and Wright (1921). Engledow and Wadham (1923) advocated the physiological basis of yield and correlation between physiological components and yield.

The estimates of correlation coefficients indicate only the inter-relationship of the character but, do not furnish information on the cause and effect relationships. Wright (1921) has devised the analysis of path coefficient to provide effective means of finding out direct and indirect causes of association which permits the critical examination of specific forces acting to produce a given correlation and measures the relative importance of each causal factor. Dewey and Lu (1959) were the first to demonstrate the utility of path coefficient analysis in breeding programme using crested wheat grass progenies.

Tomato (*Solanum lycopersicon* (Mill.) Wettsd.), 2n=2x=24 is one of the most versatile vegetable crop grown throughout the world because of its wider adaptability, high yielding potential and suitability for uses in fresh as well as processed food industries. It is one of the most popular and widely cultivated vegetable throughout the world and ranking second in importance after potato in many countries including India (Anonymous, 2015). In India, total area is 0.77 million hectare and production is 18.28 million tonnes with 23.74 tonnes per hectare productivity, which is very low as compared to average productivity of world.

Adapting the potentiality of this crop, there is a need for improvement and to develop varieties suited to specific agro-ecological conditions and also for specific end use. A thorough knowledge regarding the amount of genetic variability existing for various characters is essential for initiating the crop improvement programme. With limited variability much cannot be achieved and the breeder will have to enrich the germplasm or resort to create greater variability through hybridization, mutation and polyploidy.

The objective of present investigation was to know the association among the economic traits using path coefficient analysis.

43

REDMI NOTE 8 PRO
AI QUAD CAMERA

Vegetable Science (2017) 44 (1) : 139-141

Genetic variability, heritability and genetic advance in vegetable pea (*Pisum sativum* L. var. *hortense*)

Maneesh Pandey*, V.B. Singh and G.C. Yadav, Pradip Pandey[1], and Yamuna Prasad Singh

Received: June 2017 / Accepted: July 2017

Vegetable pea (*Pisum sativum* L. var. *hortense*) belongs to family Leguminoceae sub family Fabaceae. Pea is an important legume vegetable, extensively cultivated in the temperate regions and restricted to cooler altitudes in the tropics and winter season in the sub-tropics. It is a self-pollinated crop having diploid chromosome number, 2n=14. It is highly nutritious and capable of fixing atmospheric nitrogen. Being most important to growers and consumer, there is an urgent need to increase its productivity to fulfill the increasing demands throughout the year. The information usually needed for developing high yield varieties in a particular species pertains to the extent of genetic variability for desirable traits in the available germplasm. Evaluation of germplasm is the basic tool for identification of improved genotypes. The great extent of natural variation present in various characters among the genotypes suggests good scope of improvement in economic traits. Large variability ensures better chance for selection of new genotypes. Variability parameters like genotypic and phenotypic coefficient of variation, heritability and genetic advance as well as degree of association between the various characters along with direct and indirect effect of yield contributing characters on yield, and genetic divergence among the genotypes for quantitative traits is of paramount significance in formulating an appropriate breeding strategy aimed to exploit the inherent variability of the original population.

The experiment was conducted at NDUAT, Faizabad, UP by using Randomized Complete Block Design with three replications during *Rabi* season of 2013 to assess the performance of 36 vegetable pea genotypes. Each genotype consisted of five rows and replicated thrice. Each entry was grown in the plot size of and 3.0×1.5 m. The line sowing was done with the spacing of 30 cm and 10 cm from seed to seed. All the recommended agronomic package of practices and plant protection measures were followed to raise a healthy crop. Observations were recorded on five randomly selected plants from each treatment in each replication for; (i) nodes at which first flower appears, (ii) days to 50% flowering, (iii) number of nodes per plant (iv) inter-nodal length (cm), (v) primary branches per plant, (vi) plant height (cm) (provide units), (vii) length of pod (cm), (viii) width of pod (cm), (ix) number of green pods per plant, (x) number of green pods per cluster, (xi) number of seeds per pod (xii) shelling percent (xiii) pod weight (g), (xiv) TSS of edible seeds (Brix), (xv) pod yield per plant (g). The mean squares for error was subtracted from the mean squares due to genotypes and the difference was divided by number of replications for obtaining the genotypic variance, which was calculated according to the method suggested by Burton (1952). Environmental variance is the mean squares due to error. Phenotypic variance was calculated by adding genotypic variance and environmental variance, which was suggested by Burton and de Vane (1953). Heritability in broad sense (h^2_{bs}) was calculated using the formula suggested by Burton and de Vane (1953).Genetic advance (GA) was estimated by the method suggested by Johnson et al. (1955).

The mean squares due to genotypes were highly significant for all the fifteen traits (Table 1), indicating significant differences among the genotypes with respect to all the traits under study. In general, the phenotypic coefficient of variability (PCV) was higher than the respective genotypic coefficients of variability (GCV) for all the characters which indicates that environment played an important role in the expression of the traits. The highest phenotypic and genotypic coefficient of variation was observed for plant height, green pod yield per plant, days to 50% flowering, shelling per cent and number of green pod per plant. Singh and Dhillon (2004) and Kumaran et al. (1995) also reported higher GCV and PCV for number of green pod per plant, weight of

Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad-224229, UP
[1]BBAU, Lucknow-226025, UP
*Corresponding author email: maneeshpandey9219@gmail.com

REDMI NOTE 8 PRO
AI QUAD CAMERA

43

Journal of Pharmacognosy and Phytochemistry 2017; 6(4): 84-88

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(4): 84-88
Received: 05-05-2017
Accepted: 10-06-2017

Deepak Kumar Gautam
Research scholar, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

GC Yadav
Assistant Professor, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Deepak Kumar Gautam
Research scholar, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Gene action for growth, yield and quality traits in bottle gourd [*Lagenaria siceraria* (Mol.) Standl]

Deepak Kumar Gautam and GC Yadav

Abstract
The present investigation was carried out in two different seasons with aim to find out the gene action for inheritance of morphological, yield and quality traits in bottle gourd. The present study was comprised of 45 crosses developed through diallel mating design using 10 parents namely, NDBG-49-2 (P_1), N. Rashmi (P_2), N. Prabha (P_3), N. Pooja (P_4), Pusa Naveen (P_5), Pb. Komal (P_6), NDBG S-1 (P_7), PBOG-3 (P_8), NDBG-11 (P_9) and Faizabadi Local (P_{10}) at MES, Vegetable Science, NDUA &T, Kumarganj, Faizabad (U.P.) India during *kharif* 2015 (E_1), and *Rabi*, 2015-16 (E_2). The experiments were laid out in RBD with three replications having each experimental unit of single row with spacing of 3.0 m × 0.5 m. The observations were recorded on parents and F_1's for eighteen quantitative traits including six quality traits *viz* days to first staminate flower anthesis, days to first pistillate flower anthesis, node number to first staminate flower, node number to first pistillate flower appearance, days to first fruit harvest, vine length at last picking stage (m), number of primary branches per plant, fruit length (cm), fruit circumference (cm), fruit weight (kg), number of fruits per plant, fruit yield per plant (kg), total soluble solids (°B), ascorbic acid (mg/100 g fresh fruit), reducing sugar (%), non-reducing sugar (%), total sugars (%) and dry matter content in fruit (%). The present study revealed that Highly significant values for additive ($\hat{D}$) and dominance ($\hat{H}_1$ and $\hat{H}_2$) effects of components were observed for most of the eighteen traits in both the seasons (E_1, E_2) except the values of $\hat{D}$ for days to first staminate flower anthesis, number of fruit per plant, reducing sugar and total sugars and node number to first staminate flower appearance and days to first fruit harvest in E_1 and values of $\hat{H}_1$ for node number to first staminate flower appearance, node number to first pistillate flower appearance in E_1 which showed non-significant Both additive and dominance variance were found important in the inheritance of most of the traits, whereas dominance variance were more prominent than the additive variance. Average degree of dominance revealed the presence of over dominance for all the characters in during both the seasons (E_1, E_2). The proportions of genes ($\hat{H}_2/4\hat{H}_1$) in the parents were less than 0.25 for all the traits indicating asymmetrical distribution of alleles at loci showing dominance during both the seasons (E_1, E_2).

Keywords: Bottle gourd, gene action, quality attributes fruit yield and diallel mating

Introduction

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl., 2n =2x= 22] is an important cultivated annual cucurbitaceous crop grown throughout the country. Being warm season vegetable crop it thrives well in warm and humid climate but at present it's off season cultivation has progressively stretched throughout the year in northern Indian plains. According to De Candolle (1882), bottle gourd has been found in wild form in South Africa and India. However, Cutler and Whitaker (1961) [2] are of the view that probably it is indigenous to tropical Africa on the basis of variability in seeds and fruits. The tender fruits of bottle gourd can be used as a vegetable or for making sweets (e.g. *Halva, kheer, petha* and *burfi* etc.), kofta and pickles. The fruit is rich in pectin also, which showed good prospects for jelly preparation. A decoction made from the leaf is a very good medicine for jaundice. The fruit has cooling effect, it is a cardiotonic and diuretic, good for people suffering from biliousness, indigestion and convalescences *i.e.*, regain health after illness. The pulp is good for overcoming constipation, cough, and night blindness and as an antidote against certain poisons. The plant extract is used as a cathartic and seeds are used in dropsy. In addition, the seeds and seed oil are edible. The fruits contain 96.3 per cent moisture, 2.9 per cent carbohydrate, 0.2 per cent protein, 0.1 per cent fat, 0.5 per cent mineral matter and 11 mg of vitamin C (Ascorbic acid) per 100 g fresh weight (Thamburaj and Singh, 2005) [11]. The existence of significant amount of non-additive gene action is a prerequisite for exploitation of heterosis. The specific combining ability variance largely is the measure of dominance variance. If heterosis is high for specific cross and observations made are true for economic trait like yield, it is possible to utilize the cross as a commercial hybrid provided that the pollination system of the crop permits commercial seed production of hybrids or there exists a male sterility, fertility restoration system.

42

The Pharma Innovation Journal 2017; 6(12): 430-432

www.ThePharmaJournal.com

The Pharma Innovation

Gene action studies in tomato (*Solanum lycopersicon* (Mill.) Wettsd.) For growth, yield and quality traits

Satish Yadav, GC Yadav, Vimlesh Kumar and Dheeraj Yadav

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating 2017: 5.03
TPI 2017; 6(12): 430-432
© 2017 TPI
www.thepharmajournal.com
Received: 16-10-2017
Accepted: 08-11-2017

Satish Yadav
Department of Vegetable Science, Department of Horticulture, NDUA&T Kumarganj Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, Department of Horticulture, NDUA&T Kumarganj Faizabad, Uttar Pradesh, India

Vimlesh Kumar
Department of Vegetable Science, Department of Horticulture, NDUA&T Kumarganj Faizabad, Uttar Pradesh, India

Dheeraj Yadav
Department of Vegetable Science, Department of Horticulture, NDUA&T Kumarganj Faizabad, Uttar Pradesh, India

Correspondence
Satish Yadav
Department of Vegetable Science, Department of Horticulture, NDUA&T Kumarganj Faizabad, Uttar Pradesh, India

Abstract
The present investigation was conducted using 36 cross combination obtained by crossing 9 lines with 4 tester in Line × Tester mating design to know the gene effects with to respect to its nature and magnitude for growth, yield and quality characters. The study revealed estimates of sca variance were higher than gca variances for all most of the traits. The value of sca variances were found significant and positive for all the characters. Likewise, positive and significant gca variances were also exhibited by almost all the characters. The value of degree of dominance was more than unity (1) for all the traits except for plant height (0.76), pericarp thickness (0.74), number of fruits per plant (0.83) and ascorbic acid (0.90) and revealed over dominance in 2012 -2013. The value of degree of dominance was more than unity (1) for all the traits except for plant height (0.68) and ascorbic acid (0.83) and revealed over dominance in 2013-2014. Plant height, pericarp thickness and ascorbic acid in fruit exhibited average degree of dominance less than unity (1) indicating partial dominance. These results clearly indicates that in the majority growth, yield quality non-additive gene action were in preponderance practice of exploration of hybrid vigor in tomato.

Keywords: Gene action, average degree of dominance, tomato, combining ability, line × tester

Introduction
Tomato (*Solanum lycopersicon* (Mill.) Wettsd.), 2n=24) of nightshade or Solanaceae family with primary center of origin in Mexico-Peru-Equador region was once considered inedible but has evolved into globally leading popular vegetable. It is highly worked crop by the horticulturists and breeders. It has wide range of variation in terms of growth habit, morphological traits and uses making it a repository of glowing traits in its armory. It is used as fresh as well as processed vegetable. The total area of tomato in India is 9205 hectare which is 9.6 per cent of vegetables area. While, the total production is 18226.6 mt which is 11.2 per cent of total vegetables production(20.7 mt/ha). The leading tomato producing states are U.P. (12.1%), West Bengal (15.7%), Bihar (10.16%), Gujrat (6.2%) and Punjab (4.3%) (Annonymous, 2014) [5] It is also very important for processing industry as it ranks first as processing vegetable crops in the world.Ripe tomato is widely used for the preparation of several processed items like paste, syrup, juice, soup, ketchup, drinks, whole peeled tomato and canned tomato etc, in the processing industry on large scale. Being very good appetizer, tomato is rich source of minerals, vitamins and organic acids. Its nutritional importance is enlarged with antioxidant properties of lycopene and its anticancerous properties. Growing consumption of tomato in processed or fresh form is driven by its versatile, palatable, culinary and attractive properties apart from its health benefits. It was introduced in India in 17th century by Europeans and today it has become part and parcel of Indian food besides becoming one of the leading vegetable with lot of research work and outcomes seen in it. Globally, India is the third largest producer of tomato after China and USA. Hence the present study to understand the ene effects governing various growth, yield and quality traits.

Materials and methods
The present investigation was carried out at the Main Vegetable Research Station, Division of Vegetable Science, and in the laboratory of the College of Horticulture and Forestry, Narendra Deva University of Agriculture and Technology Narendra Nagar (Kumarganj). Faizabad, India, during 2012- 13 and 2013-14. The farm is situated at 26.56° N latitude and 82.12° E longitudes at an altitude of 113 m above the mean sea level. The soil type of experimental site was sandy loam. This area falls in sub-tropical zone of Eastern India and experimental designs adopted, statistical procedures followed and methodology adopted is described here under.

REDMI NOTE 8 PRO
AI QUAD CAMERA

The Pharma Innovation Journal 2017; 6(12): 18-26
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating 2017: 5.03
TPI 2017; 6(12): 18-26
© 2017 TPI
www.thepharmajournal.com
Received: 08-10-2017
Accepted: 07-11-2017

Vimlesh Kumar
Department of Vegetable Science
N.D. U. A. & T. Kumarganj
Faizabad, Uttar Pradesh, India

DP Mishra
Department of Vegetable Science
N.D. U. A. & T. Kumarganj
Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science
N.D. U. A. & T. Kumarganj
Faizabad, Uttar Pradesh, India

Umesh Babu
KVK, Sant Kabir Nagar
N.D. U. A. & T. Kumarganj
Faizabad, Uttar Pradesh, India

Correspondence
Vimlesh Kumar
Department of Vegetable Science
N.D. U. A. & T. Kumarganj
Faizabad, Uttar Pradesh, India

Determining relationships between different growth and yield traits in pumpkin with path coefficient analysis

Vimlesh Kumar, DP Mishra, GC Yadav and Umesh Babu

Abstract
The objective of this study was to determine the relationships among fruit yield per plant (Kg), growth and economic traits using twenty one genotypes (15 F_1 hybrids and 6 Parents) of pumpkin during three seasons (E_1, E_2, E_3) and pooled analysis worked out. The observations were measured on growth and yield attributing traits. The present investigation revealed that the fruit yield per plant had exhibited significant and positive phenotypic correlation with number of fruits per plant, average fruit weight, total soluble solids, vine length, flesh thickness, number of primary branches per plant, equatorial circumference of fruit and negative significant association with days to first male flower anthesis, days to first female flower anthesis, days to first fruit harvest, inter nodal length and node number to first male flower appearance at phenotypic level during all three seasons and over seasons (pooled) except node number to first male flower appearance during E_1 and E_2. Analysis of path coefficient revealed that highest positive direct effect on fruit yield per plant was exerted by number of fruit per plant followed by average fruit weight at phenotypic level. Whereas, higher negative direct effects exerted by days to first fruit harvest.

Keywords: Pumpkin, correlation, fruit yield per plant, path analysis

Introduction
Pumpkin (*Cucurbita moschata* Duch. ex. Poir) is one of the most important vegetable crops of family cucurbitaceae grown throughout the world not only for providing better nutrition to the consumers but also higher returns to the farmers. It is originated from central Maxico. Pumpkin is a herbaceous annual, sexually propagated vegetable with chromosome number 2n=2x=40. The word pumpkin was originated from the Greek word *pepon*, which means "large melon", something round and large.

Pumpkin is relatively high in energy and carbohydrates and a good source of vitamins, especially high caretenoid pigments and minerals. It may certainly contribute to improve nutritional status of the people, particularly the vulnerable groups in respect of vitamin A requirement. Night-blindness is a serious problem of South Asian countries. Encouraging the mass people to take more pumpkin can easily be solved the problem.

Pumpkin exhibits great variability in its fruit shape, size, colour and yield along with other agronomic attributes (Singh, 2005 and Singh *et al.*, 2005) [16]. Like other cucurbits pumpkin is warm season crop and hence it may be cultivated round the year in central and southern states of the country, whereas, in northern parts of the country which face cooler winter months, it is generally cultivated during summer and rainy seasons for which sowing is generally done from January to July. Villagers in north India plant it in month of July-August after onset of monsoon in the mounds or hills in the vicinity of house and the growing plants are trained on thatches, hutments and other abandoned spaces. These genotypes used for planting in the vicinity of household are usually land races traditionally maintained by villagers and locally termed as *Bhadhavaha Kohara* (rainy season type pumpkin). *Bhadhavaha Kohara* is considered relatively tolerant to cool temperature and performs well during rainy season and extends fruiting in offing winter months. Hence, these genotypes are also referred to as winter type pumpkin. The rainy season or winter season type genotypes produce adequate number of both staminate and pistillate flowers from late August to early September (which happens to be *Bhadrapada* month or *Bhadhau* month of Hindi calendar year) and bear prolific fruits during September-October and also in short days of November-December. If not damaged by frost they may remain productive with very shy bearing in forthcoming January-February.

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 [11] October 2017: 108-111
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating : 4.95

ORIGINAL ARTICLE OPEN ACCESS

Genetic diversity assessment in Brinjal (*Solanum melongena* L.) genotypes for yield and yield components

***Dharam Veer Vaishya, G.C. Yadav, Sriom*,Kuldeep Kumar Bhargav, Vishal Tripathi,Maneesh Pandey,Devraj Singh, Manoj Kumar[3], Deepak Singh[3], and Vipul Singh[3]**
Department of Vegetable Science & Agronomy[3] NDUA&T, Kumarganj Faizabad-(224229)
*Corresponding author email: sriomgupta311@gmail.com

ABSTRACT

The present investigation conducted on thirty five diverse genotypes of brinjal(Solanum melongena L.)to know the variability among the genotypes.The observations were recorded on 9 quantitative characters viz., days to 50% flowering, days to first fruit harvest, fruit length (cm), fruit circumference (cm), plant height (cm), primary branches per plant, fruits per plant, average fruit weight (g) and total fruit yield per plant (kg). The present study revealed that the variance due to treatments were highly significant for all the characters indicating sufficient variability existing in the genotypes. Whereas, the higher magnitude of coefficient of variation at phenotypic as well as genotypic levels observed for average fruit weight followed by fruits per plant, fruit circumference, total fruit yield per plant fruit length and primary branches per plant. Days to first fruit harvest exhibited low value of variability. High heritability coupled with high genetic advance in per cent of mean were recorded for average fruit weight, fruits per plant, fruit circumference, total fruit yield per plant and fruit length indicating opportunity for selection response. In general, the phenotypic coefficient of variability was higher than genotypic coefficient of variability for all the nine characters under study which indicates that environment played a considerable role in the expression of their traits.

Keywords :Brinjal, PCV, GCV, Heritability and Genetic Advance

Received 12.07.2017 Revised 20.09.2017 **Accepted 09.10.2017**

INTRODUCTION

Brinjal (*Solanum melongena* L., 2n=2x=24) belongs to the family Solanaceae. It is worldwide **known as aubergine or guinea** squash which is one of the most popular and major vegetable crop in India **and other parts of the world.** It is probably originated in India and showed secondary diversity in South **East Asia. It is being grown extensively** in India, Bangladesh, Pakistan, China, Japan, Philippines, France, **Italy and U.S.A. Brinjal** is being cultivated in India over an area of 0.68 million ha with an **average annual production of** 12.70 million tonnes and productivity of 18.26 mt/ha. It is distributed in **Orissa, Bihar, Karnataka,** West Bangal, Andhra Pradesh, Maharashtra and Utter Pradesh. In Uttar **Pradesh, brinjal is being cultivated** on an area of 4.10 lakh ha with annual production of 136.16 lakh tones [1]. **Brinjal being most important** to growers and consumer, there is pressing need to increase its productivity **to fulfil the increasing** demands throughout the year. The information usually needed for developing **high yielding varieties in a** particular species pertains to the extent of genetic variability for desirable **traits in the available germplasm.** Evaluation of germplasm is the basic tool for identification of important **genotypes. The great extent** of natural variation present in various characters among the genotypes **suggests good scope of improvement** in economic traits. Large variability ensures better chance of producing **new forms. Variability** parameters like genotypic and phenotypic coefficient of variations, heritability and **genetic advance,** along with degree of association between the various characters and direct effect of yield contributing characters on total yield, is of paramount significance in formulating an appropriate breeding strategy aimed at exploiting the inherent variability of the original population. Phenotypic variability changes under different environmental conditions while genetic variability remains unchanged and more useful to a plant breeder for exploitation in selection or hybridization. Yield is very complex characteristics controlled by several yield contributing components and it is highly influenced by environmental factors, consequently estimates of heritability and genetic advance are useful for selection.

REDMI NOTE 8 PRO
AI QUAD CAMERA

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 [11] October 2017: 123-130
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating : 4.95

ORIGINAL ARTICLE OPEN ACCESS

Correlation and Path Coefficient analysis among Different characters in genotypes of Vegetable Pea

*Maneesh Pandey[1], V.B Singh[1], G.C. Yadav[1], Nidhi Tyagi[1], Gaurav Singh Vishen[2] *Sriom[1], K. K. Bhargav[1],and Pradip Pandey[3]
Department of Vegetable Science[1] & Horticulture[2]NDUA&T, Kumarganj Faizabad-(224229)
Department of Horticulture BBAU Lucknow[3]
*Corresponding author email: maneeshpandey9219@gmail.com

ABSTRACT

Correlation and path analysis studies conducted during Rabi in Randomized complete block design thirty six genotypes of vegetable pea with the objective to know association among the characters viz.,node at which first flower appears, days to 50 % flowering, number of nodes per plant, intermodal length (cm), primary branches per plant, plant height (cm), length of green pod (cm), width of pod, (cm), number of green pods per plant, number of green pods per cluster, number of seeds per pod, shelling per cent, green pod weight (g), T.S.S of edible seed, green pod yield per plant(g).Present study revealed that number of green pods, T.S.S of edible seeds number of node per plant, length of pod (cm), plant height (cm),significantly and positively associated with green pod yield per plant (g) both at phenotypic as well as genotypic levels while negatively correlated with width of pod (cm).It may be concluded that improvement of characters like number of green pods per plant, pod weight, number of green pod per cluster, length of pod, number of nodes per plant and plant height would help in improving pod yield in vegetable pea and should be considered as selection criteria for yield improvement. Path coefficient analysis revealed that green pod yield followed by number of green pods per plant, pod weight exerted high positive direct effect at phenotypic level. Therefore, these characters appear to be the most important traits for vegetable pea improvement programme.

Keywords: *Pisum Sativum L.var. hortense, correlation , path analysis*

Received 12.07.2017 Revised 25.09.2017 Accepted 01.10.2010

INTRODUCTION

Vegetable pea (*Pisum sativumL. var. hortense*) belongs to family Leguminoceae sub family Fabaceae. Pea is an important legume vegetable, extensively cultivated in the temperate regions and restricted to cooler altitudes in the tropics and winter season in the sub tropics. It is a self pollinated crop having diploid chromosome number 2n=2x=14. It is highly nutritious and capable of using atmospheric nitrogen. India ranks third in area after China and USSR under pea cultivation. . India ranks third in area after China and USSR for pea cultivation. The total area covered by peas is 498000 hectare with the production of 4811000 metric tons with productivity of 10 tons per hectare [1].

The major growing states of vegetable pea in India are Uttar Pradesh, Madhya Pradesh and Maharashtra. Uttar Pradesh is the leading producer of vegetable pea having alone about 50% of its area and production. It is also grown as summer season crop in the hilly states of India. The major area under vegetable pea cultivation is under mid season because of its suitability in various agro-climatic zones. Large proportion of vegetable pea are processed (canned, frozen and dehydrated and pickle) for consumption. It is mostly consumed as green fresh grains for vegetable purpose. Phenotypic variability changes under different environmental conditions while genetic variability remains unchanged and more useful to a plant breeder for exploitation in selection or hybridization, consequently estimates of heritability and genetic advance are useful for selection [2]. Yield is very complex characteristics controlled by several yield contributing components and significantly influenced by environmental factors. Estimation of correlation co-efficient among the yield contributing characters is necessary to understand the direction of selection and maximize yield in the shortest period. Path co-efficient provides an effective means of entangling direct and indirect causes of association of characters and measures the relative importance of each causal factor.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(3): 14-18
Received: 20-03-2017
Accepted: 22-04-2017

Vimlesh Kumar
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, U.P., India.

DP Mishra
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, U.P., India

GC Yadav
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, U.P., India

DK Dwivedi
Department of P.M.B. &G.E./CPB, N.D.U. A&T. Kumarganj, Faizabad, U.P., India

Correspondence
Vimlesh Kumar
Department of Vegetable Science, N.D.U. A&T. Kumarganj, Faizabad, U.P., India

Genetic diversity assessment for morphological, yield and biochemical traits in genotypes of pumpkin

Vimlesh Kumar, DP Mishra, GC Yadav and DK Dwivedi

Abstract
The investigations were conducted with the using of twenty one genotypes (15 F_1 hybrids and 6 parents) of pumpkin. The germplasms were evaluated for twenty one morphological, yield and biochemical traits viz., days to first male flower anthesis, days to first female flower anthesis, node number to first male flower, node number to first female flower, days to first fruit harvest, number of primary branches per plant,7. Equatorial circumference of fruit, polar circumference of fruit, Flesh thickness, internodal length (cm), vine length (m), average fruit weight (kg), number of fruits per plant, Fruit yield per plant (kg), dry matter content, total soluble solids, total sugars, reducing sugars, non-reducing sugars, ascorbic acid content and β-carotene. The evaluations were conducted consecutively three seasons during 2015-16. The study revealed that mean squares due to genotypes were significant for all the traits during all three seasons (E_1, E_2, E_3). However, the analysis of variance on the basis of pooled revealed that mean squares due genotypes, environments, overall sum found significant for all the traits except overall sum for traits viz., flesh thickness, dry matter content and total sugars content. The investigations further revealed that high phenotypic and genotypic coefficient of variation were observed for vine length, number of fruits per plant, fruit yield per plant, reducing sugars and β-carotene. High heritability coupled with high genetic advance were observed for number of fruits per plant, fruit yield per plant, reducing sugars, ascorbic acid and β-carotene indicated that the improvement of these traits through selection.

Keywords: PCV, GCV, fruit yield per plant, heritability and genetic advance

1. Introduction
Pumpkin (*Cucurbita moschata* Duch. ex. Poir) is one of the most important vegetable crop of cucurbitaceae family grown throughout the world not only for good sources of nutrition to the consumers but also for its higher returns to the farmers. It is originated from central Maxico. Pumpkin is a herbaceous annual, sexually propagated vegetable having an identical genomic formula 2n=2x=40. The word pumpkin originates from the word *pepon*, which is a Greek word meaning for "large melon", something round and large.

Based on commercial significance the cultivated *Cucurbita* species rank collectively among the 10 leading vegetable crops worldwide. China and India lead the world production. Other major producers are U.S., Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey (Ferriol and Pico, 2008). The total area of pumpkin in India is 19760 hectare whereas, the total production is 0.42 million tonne (Annonymous 2016) [1]. Robinson and Decker-Walters (1999) [19] concluded that in genus *Cucurbita* there are 5 cultivated and 10 wild species. Seshadri and More (2009) [20] also stated that the recent recognition of synonyms and taxonomic changes have reduced the number of *Cucurbita* species to 15 or even less.

The color of pumpkins is derived from the orange pigments abundant in them. The main nutrients are lutein and both alpha and beta carotene, the latter of which generates vitamin A in the body. Pumpkins are very versatile in their uses for cooking. Most parts of the pumpkin are edible, including the fleshy shell, the seeds, the leaves, and even the flowers. In the United States and Canada, pumpkin is a popular Halloween and Thanksgiving staple. Pumpkin purée is sometimes prepared and frozen for later use.

The continuous variation exhibited by quantitative traits with which the breeders have to deal with, include the heritable and non-heritable components. Though, it is difficult to assess the genotype directly but it is possible through the assessment of phenotypic expression (which is an outcome of interplay of the genotype and environment) in the existing material and thus, the study of phenotypic variability for yield and its component traits is very important.

Materials and Methods
The experiments of the present research work were conducted during *Kharif*, (E_1) *Rabi* seasons (E_2) and summer-season (E_3) of 2015-16 at Main Experiment Station of Department of

REDMI NOTE 8 PRO
AI QUAD CAMERA

EDMI NOTE 8 PRO
I QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 98-100

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 98-100

Deepak Kumar Gautam
Research scholar, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, U.P., India

GC Yadav
Assistant Professor, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, U.P., India

Correspondence
Deepak Kumar Gautam
Research scholar, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, U.P., India

Heritability (narrow sense) and genetic advance of for growth, yield and quality traits in bottle gourd [*Lagenaria siceraria* (Mol.) Standl.]

Deepak Kumar Gautam and GC Yadav

Abstract
Carried out in two different seasons with aims to assess the extent of heritability and genetic advance involving 10 parents namely, NDBG-49-2 (P_1), N. Rashmi (P_2), N. Prabha (P_3), N. Pooja (P_4), Pusa Naveen (P_5), Pb. Komal (P_6), NDBG S-1 (P_7), PBOG-3 (P_8), NDBG-11 (P_9) and Faizabadi Local (P_{10}) at MES, Vegetable Science, NDUA.&T, Narendra Nagar (Kumarganj), Faizabad (U.P.) India during *kharif* 2015 (E_1) and *Rabi*, 2015-16 (E_2). The experiments were laid out in RBD with three replications having each experimental unit of single row with spacing of 3.0 m × 0.5 m. The observations were recorded on parents and F_1's for eighteen quantitative traits including six quality traits *viz.*, days to first staminate flower anthesis, days to first pistillate flower anthesis, node number to first staminate flower, node number to first pistillate flower appearance, days to first fruit harvest, vine length (m), number of primary branches per plant, fruit length (cm), fruit circumference (cm), fruit weight (kg), number of fruits per plant, fruit yield per plant (kg), total soluble solids (°B), ascorbic acid (mg/100 g fresh fruit), reducing sugar (%), non-reducing sugar (%), total sugars (%) and dry matter content in fruit (%).The higher values of heritability (h^2n) estimates (> 30) were observed only for fruit length (52.20%, 37.50% and 35.17%) and fruit circumference (61.50%, 33.50% and 31.50%) during both the seasons and pooled. High genetic advance in per cent of mean were estimated for four traits, *viz.* number of fruit per plant (32.58%, 42.73% and 21.33%), fruit yield per plant (24.60%, 32.40% and 25.82%), reducing sugars (22.01%, 25.10% and 22.42%) and non- reducing sugar (27%, 38.96% and 28.01%) during both the seasons and pooled.

Keywords: bottle gourd, Heritability (narrow sense) and genetic advance, fruit yield per plant

Introduction

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl., 2n =2x= 22] is an important cultivated annual cucurbitaceous crop grown throughout the country. Being warm season vegetable crop it thrives well in warm and humid climate but at present it's off season cultivation has progressively stretched throughout the year in northern Indian plains. According to De Candolle (1882), Bottle gourd has been found in wild form in South Africa and India. However, Cutler and Whitaker (1961) [1] are of the view that probably it is indigenous to tropical Africa on the basis of variability in seeds and fruits. The tender fruits of bottle gourd can be used as a vegetable or for making sweets (e.g. *Halva, kheer, petha* and *burfi* etc.), kofta and pickles. The fruit is rich in pectin also, which showed good prospects for jelly preparation. A decoction made from the leaf is a very good medicine for jaundice. The fruit has cooling effect, it is a cardiotonic and diuretic, good for people suffering from biliousness, indigestion and convalescences *i.e.*, regain health after illness. The pulp is good for overcoming constipation, cough, night blindness and as an antidote against certain poisons. The plant extract is used as a cathartic and seeds are used in dropsy. In addition, the seeds and seed oil are edible. The fruits contain 96.3 per cent moisture, 2.9 per cent carbohydrate, 0.2 per cent protein, 0.1 per cent fat, 0.5 per cent mineral matter and 11 mg of vitamin C (Ascorbic acid) per 100 g fresh weight (Thamburaj and Singh, 2005) [6]. The exploitation of heterosis is much easier in cross-pollinated vegetable crops. Bottle gourd being monoecious provides ample scope for the utilization of the hybrid vigour for yield improvement of this crop. The selection of suitable parents for hybridization on the basis of phenotypic performance alone is not a sound procedure as phenotypically superior lines may yield poor recombinants in the segregating generations. It is, therefore, essential that parents should be selected on the basis of their genetic potential.

Materials and methods

The experimental materials consisted of 10 promising parental lines of bottle gourd and their

U8

Int. J. Curr. Res. Biosci. Plant Biol. 4(4): 123-129 (2017)

International Journal of Current Research in
Biosciences and Plant Biology
Volume 4 • Number 4 (April-2017) • ISSN: 2349-8080 (Online)
Journal homepage: www.ijcrbp.com

Original Research Article

doi: https://doi.org/10.20546/ijcrbp.2017.404.019

Studies on Variability, Heritability and Genetic Advance Analysis for Yield and Yield Attributes of Garlic (*Allium sativum* L.)

Pradeep Kumar[2], C.N. Ram[1], G. C. Yadav[1], Deepak Kumar Gautam[2]*, Pushpendra Kumar[2] and Rajesh Kumar[3]

[1]Assistant Professor and [2]Student, Department of Vegetable Science, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U.P.), India
[3]Research Scholar, Department of Horticulture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad-224 229 (U.P.), India

*Corresponding author.

Abstract

The experiment was conducted in Augmented Block Design at Main Experimental Station of Department of Vegetable Science, Narendra Deva University of Agriculture, Narendra Nagar (Kumarganj), Faizabad (U.P.) during *Rabi* 2014-15 with the following objectives (1) To find out phenotypic and genotypic coefficient of variation (PCV & GCV), (2) to estimate heritability and genetic advance, Experimental material for the present study consisted of thirty genotypes. In single plot sized 2.0 X 0.30 cm with the distance of 30 cm row to row and 10 cm plant to plant. Observation were recorded on plant height (cm), leaves per plant, length of leaf (cm), width of leaf (cm), neck thickness of bulb (cm), cloves per bulb, weight of clove (g), length of clove (cm), length of bulb (cm), width of clove (cm), diameter of bulb (cm), total soluble solids (%) and bulb yield per plant (g).Analysis of variance for design of experiment indicated highly significant differences among treatments for all the characters, based on mean performance of genotypes, the NDG-43, NDG-49, Punjab Garlic, NDG-48 and NDG-45, were identified as most promising genotypes for bulb yield per plant. The higher magnitude of coefficient of variation at genotypic as well as phenotypic levels observed for leaves per plant, length of leaf, length of clove. High heritability coupled with high genetic advance in per cent of mean was recorded for number of cloves per bulb, Bulb yield per plant, weight of clove and width of leaf. It is suggested that selection for these traits will directly increase bulb yield per plant.

Article Info

Accepted: 01 April 2017
Available Online: 06 April 2017

Keywords

Allium sativum L.
Garlic
Genetic advance
Genotypic coefficient of variation
Heritability
Phenotypic coefficient of variation

Introduction

Garlic (*Allium sativum* L.) having diploid chromosome number 2n=2x=16 belongs to the family Amaryllidaceae (Alliaceae); known as *Lahsun* in Hindi, is one of the important bulb crop grown in India. It has long been recognized as a valuable spice and condiments in India. It is a frost hardy bulbous, erect annual herb with narrow flat leaves and bears small white flowers and bulbils (Janick, 1979). Garlic is a scapigerous foetid perennial

33

REDMI NOTE 8 PRO
AI QUAD CAMERA

Journal of Pharmacognosy and Phytochemistry 2017; 6(3): 342-345

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(3): 342-345
Received: 28-03-2017
Accepted: 29-04-2017

Amar Nand Yadav
Department of Vegetable Science, NDUA & T Kumarganj Faizabad, Uttar Pradesh, India

VB Singh
Department of Vegetable Science, NDUA & T Kumarganj Faizabad, Uttar Pradesh, India

GC Yadav
Department of Vegetable Science, NDUA & T Kumarganj Faizabad, Uttar Pradesh, India

Vimlesh Kumar
Department of Vegetable Science, NDUA & T Kumarganj Faizabad, Uttar Pradesh, India

Correspondence
Vimlesh Kumar
Department of Vegetable Science, NDUA & T Kumarganj Faizabad, Uttar Pradesh, India

Determining relationships between different Horticultural and Yield Traits in sponge gourd (*Luffa cylindrica* Roem.) Genotypes with path coefficient analysis

Amar Nand Yadav, VB Singh, GC Yadav and Vimlesh Kumar

Abstract
The aim of experiment was to study the inter-relationship and direct-indirect effect among yield and yield attributes in sponge gourd. The analysis of variance revealed that the mean sum of squares due to genotypes were significant for all the eleven traits. The genotypic correlation in general was greater than the phenotypic correlation. The significant and positive correlation with yield per plant was observed at phenotypic level with average fruit weight (0.462) and number of fruits per plant (0.476). Path coefficient revealed appreciable amount of direct positive effect of number of fruit per plant (0.653) followed by average fruit weight (0.571) and days to anthesis of firs pistillate flower (0.156) on fruit yield per plant. The study concluded that the average fruit weight and number of fruits per plant in due consideration for improvement of genotypes in respect to yield.

Keywords: Luffa (*Luffa cylindrica* Roem.), correlation, path analysis, fruit yield.

1. Introduction
Luffa (*Luffa cylindrica* Roem.) commonly called as sponge gourd, loofah vegetable sponge or dish cloth, having diploid chromosome number 2n = 2x = 26. It is one of the most important cucurbits grown throughout the country and world. It belongs to the family Cucurbitaceae which includes about 118 genera and 825 species. In India, a number of major and minor cucurbits are cultivated which share about 5.6 per cent of the total vegetable production.
The prime objective of the present investigation is to make an improvement in yield, but yield is a complex character and a combined result of a number of component traits. Since yield is controlled polygenically and influenced greatly by the environmental fluctuations. Therefore, the selection of superior genotype based on yield alone would not be effective. One has to put attention on the component characters, which contribute yield in positive direction. In India little attention has been given for the genetic improvement of sponge gourd by collecting diverse germplasm, their morphological characterization and assessing the variability parameters like coefficient of variation, coefficient of correlation and path analysis. The appropriate breeding methodologies may be adopted for genetic improvement of this crop for simultaneously improvement of different characters, information regarding mutual relationship among the characters and direction of correlation analysis provides an effective means of finding out direct and indirect causes of association among causal variables. Keeping in view, of the above facts the present experiment was conducted to determining association of yield and its attributes for yield improvement in sponge gourd.

2. Material and Methods
Thirty genotypes of sponge gourd were evaluated in Randomized Complete Block Design with three replications at Department of Vegetable Science, N.D. University of Agriculture & Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) India. The crop was planted in 3.0 m. for row length, spaced 3.0 m. apart where, 0.5m. Plant to plant spacing was maintained. The experiment was sown in summer on 2nd April, 2010. All the recommended agronomic package and practices and plant protection measures were followed to raise a good crop. Observations were recorded on five randomly selected plants for eleven characters *viz.*, node no. to anthesis of first staminate flower, node no. to anthesis of first pistillate flower, days to anthesis of first staminate flower, days to anthesis of first pistillate flower, days of first fruit harvest, average fruit weight (g), fruit length (cm), fruit diameter (cm), number of fruits/plant, fruit yield/plant (kg) and vine length (m).

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO
AI QUAD CAMERA

38

Int.J.Curr.Microbiol.App.Sci (2017) 6(5): 982-989

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 5 (2017) pp. 982-989
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.605.108

Evaluation of F1 Hybrids/Genotypes of Pumpkin for Biochemical Traits

Vimlesh Kumar[1]*, D.P. Mishra[1], G.C. Yadav[1] and D.K. Dwivedi[2]

[1]Department of Vegetable Science, [2]Department of P.M.B. & G.E./GPB
N.D.U. A. & T. Kumarganj, Faizabad-224229 (U.P.), India
*Corresponding author

Keywords

Biochemical traits, Pumpkin, F1 hybrids, β-carotene

Article Info

Accepted:
12 April 2017
Available Online:
10 May 2017

A B S T R A C T

The investigations were conducted with the using of 15 F_1 hybrids developed through diallel excluding reciprocals with 6 parents of pumpkin. The germplasms were evaluated for seven biochemical traits, *viz.*, dry matter content, total soluble solids, total sugars, reducing sugars, non-reducing sugars, ascorbic acid content and β-carotene. The analysis of variance revealed wide range of variation among genotypes for all the traits. On the basis of mean performance the hybrids namely, $P_2\times P_4$ and $P_3\times P_5$ for dry matter content, $P_5\times P_6$ and $P_1\times P_5$ for total soluble solids, $P_2\times P_3$ and $P_1\times P_4$ for total sugars (%), $P_2\times P_5$ and $P_3\times P_5$ for reducing sugars (%), $P_1\times P_3$ and $P_2\times P_3$ for non-reducing sugars (%), $P_1\times P_2$ and $P_4\times P_6$ for ascorbic acid (mg/100g) and $P_3\times P_6$ and $P_1\times P_2$ for β-carotene were first and second ranker on the basis of merit during pooled analysis respectively. The study concluded that these hybrids can be exploited for cultivation.

Introduction

Pumpkin (*Cucurbita moschata* Duch. ex. Poir) is one of the most important vegetable crop of cucurbitacea family grown throughout the world not only for good sources of nutrition to the consumers but also for it s higher returns to the farmers. It is originated from central Maxico. Pumpkin is a herbaceous annual, sexually propagated vegetable having an identical genomic formula 2n=2x=40. The word pumpkin originates from the word *pepon*, which is a Greek word meaning for "large melon", something round and large.

Cytogenetically, the species of *Cucurbita* show amazing uniformity in chromosome number and all the species have 20 pairs (2n = 40) of small, dot like chromosomes (Whitaker and Robinson 1986) and isozyme studies indicate the allotetraploid origin of the genus (Weeden, 1984; Kirkpatrick *et al.*, 1985). Based on commercial significance the cultivated *Cucurbita* species rank collectively among the 10 leading vegetable crops worldwide. China and India lead the world production. Other major producers are U.S., Egypt, Mexico, Ukraine, Cuba, Italy, Iran and Turkey (Ferriol and Pico, 2008). The total area of pumpkin in India is 19760 hectare whereas, the total production is 0.42 million tonne (Annonymous, 2015). Robinson and Decker-Walters (1999) concluded that in genus *Cucurbita* there are 5 cultivated and 10 wild species. Seshadri and More (2009) also

38

Available online at www.ijpab.com
DOI: http://dx.doi.org/10.18782/2320-7051.2808
ISSN: 2320 – 7051
Int. J. Pure App. Biosci. 5 (2): 908-912 (2017)
International Journal of Pure & Applied Bioscience
Research Article
OPEN ACCESS

Studies on Genetic Variability, Heritability and Genetic Advance in Tomato [*Solanum lycopersicon* (Mill.) Wettsd.]

Arvind Kumar Singh[1], C. N. Ram[1], G.C. Yadav[1], R.K. Srivastava[2], Chandra Deo[1], Deepak Kumar Gautam[1*], Pushpendra Kumar[1] and Prateek Kumar[1]

[1]Department of Vegetable Science, [2]Seed Technology and [3]P.G. College Ghazipur
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India
*Corresponding Author E-mail: pkgoyal4699@gmail.com

Received: 7.04.2017 | Revised: 15.04.2017 | Accepted: 16.04.2017

ABSTRACT

Thirty-five genotypes of tomato were evaluated for yield and yield attributing characters at the Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during winter 2013-2014. Observations were recorded on nine quantitative characters viz., days to 50 per cent flowering, plant height (cm), number of primary branches per plant, number of locules per fruit, pericarp thickness (mm), average fruit weight (g), total soluble solids, number of fruits per plant and fruit yield per plant (g). High magnitude of phenotypic as well as genotypic coefficients of variation were observed in case of fruit yield per plant followed by average fruit weight, number of locules per fruit, number of fruits per plant, plant height and number of primary branches per plant. Days to 50 per cent flowering exhibited low level of variability. High heritability coupled with high genetic advance were estimated for all the traits except days to 50 per cent flowering indicating opportunity for selection response.

Key words: *Tomato, Colour, Flavour, Genetic variability, Phenotypic, Genotypic*

INTRODUCTION

Tomato [*Solanum lycopersicon* (Mill.) Wettsd] is one of the most important solanaceous vegetable crop having diploid chromosome number 2n=2x=24. It is herbaceous, annual to perennial, prostrate and sexually propagated crop plant with bisexual flowers. There are four to eight flowers in each compound inflorescence. There is a light protective anther cone surrounding the stigma leading to self-pollination. Considering the potentiality of this crop, there is a need for improvement and to develop varieties suited to specific agro-ecological conditions and also for specific use. Since, it is used as fresh vegetable and it also in processing industry for preparations of various value added products such as soup, ketchups, sauces, concentrates, purees, juices etc. It contributes as an important source of lycopene (an antioxidant), ascorbic acid and ß-carotene.

Cite this article: Singh, A.K., Ram, C. N., Yadav, G.C., Srivastava, R.K., Deo, C., Gautam, D.K., Kumar, P. and Kumar, P., Studies on Genetic Variability, Heritability and Genetic Advance in Tomato [*Solanum lycopersicon* (Mill.) Wettsd.], *Int. J. Pure App. Biosci.* **5(2):** 908-912 (2017). doi: http://dx.doi.org/10.18782/2320-7051.2808

Copyright © April, 2017; IJPAB

REDMI NOTE 8 PRO
AI QUAD CAMERA

Available online at www.ijpab.com
DOI: http://dx.doi.org/10.18782/2320-7051.2807
ISSN: 2320 – 7051
Int. J. Pure App. Biosci. 5 (2): 931-936 (2017)
Research Article
International Journal of Pure & Applied Bioscience
OPEN ACCESS

Studies on Correlation and Path Coefficient Analysis in Tomato [*Solanum lycopersicon* (Mill.) Wettsd.]

Arvind Kumar Singh[1], C. N. Ram[1], G.C. Yadav[1], R.K. Srivastava[2], Chandra Deo[1], Jeetendra Kumar Rao[3], Deepak Kumar Gautam[1*] and Pushpendra Kumar[1]
[1]Department of Vegetable Science, [2]Seed Technology and [3]P.G. College Ghazipur
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India
*Corresponding Author E-mail: pkgoyal4699@gmail.com
Received: 7.04.2017 | Revised: 15.04.2017 | Accepted: 16.04.2017

ABSTRACT

An experiment was conducted to identify the potential genotype of tomato with high productivity and good quality. Thirty-five genotypes of tomato collected from various location were evaluated for ten quantitative characters in Randomized Complete Block Design with three replications at Main Experiment Station, Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during 2013-2014. The most important economic trait, fruit yield per plant exhibited highly significant and positive phenotypic correlation with number of fruit per plant followed by average fruit weight and number of primary branches per plant. Path coefficient analysis revealed appreciable amount of direct positive effect of fruit per plant followed by average fruit weight. On fruit yield per plant. Substantial positive indirect effect by number of fruits per plant and average fruit weight on fruits yield per plant was exerted via primary branches per plant.

Key words: *Tomato, Colour, Flavour, Productivity, Fruit*

INTRODUCTION

Tomato [*Solanum esculenton* (Mill.) Wettsd.] is one of the most important vegetable crop with diploid chromosome number 2n=2x=24. Ripe fresh tomato fruit is consumed fresh as salads and consumed after cooking and utilized in the preparation of range of processed products such as puree, paste, powder, ketchup, sauce, soup and canned whole fruits. Unripe green fruits are used for preparation of pickles and chutney. All the species of tomato are native to Western South America[9]. Tomatoes are important source of lycopene (an antioxidant), ascorbic acid and ß-carotene and valued for their colour and flavour. It is one of the most popular and widely cultivated vegetable throughout the world and ranking second in importance after potato in many countries including India[1]. Tomato is a typical day neutral plant and is mainly self-pollinated, but a certain percentage of cross-pollination also occurs. It is a warm season crop reasonably resistant to heat and drought and grows under wide range of soil and climatic conditions.

Cite this article: Singh, A.K., Ram, C. N., Yadav, G.C., Srivastava, R.K., Deo, C., Rao, J.K., Gautam, D.K. and Kumar, P., Studies on Correlation and Path Coefficient Analysis in Tomato [*Solanum lycopersicon* (Mill.) Wettsd.], *Int. J. Pure App. Biosci.* **5(2):** 931-936 (2017). doi: http://dx.doi.org/10.18782/2320-7051.2807

Copyright © April, 2017; IJPAB

37

REDMI NOTE 8 PRO
AI QUAD CAMERA

REDMI NOTE 8 PRO

40

Int.J.Curr.Microbiol.App.Sci (2017) *6*(8): 1282-1286

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 8 (2017) pp. 1282-1286
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.608.155

Estimates of Variability for Growth and Yield Attributes in Taro (*Colocasia esculenta* var. *Antiquorum* (L.) Schott)

Manvendra Singh*, G.C. Yadav, Vimlesh Kumar, Deepak Kumar Gautam and Akshay Jain

Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.), India

**Corresponding author*

Keywords

Variability, Heritability, Taro and yield per plant.

Article Info

Accepted:
17 June 2017
Available Online:
10 August 2017

ABSTRACT

The present investigation was carried out in two different environments with aim to assess genetic variation among the genotypes for growth, yield attributes. The present investigation was comprised forty diverse genotypes of taro. The present study revealed that the significant differences for sixteen traits among genotypes of taro which indicated that the presence of adequate variability which could be harnessed for developing yield potential cultivars. The phenotypic and genotypic coefficients of variation were high for width of leaf, weight of corms per plant, number of cormels per plant and petiole length. Moderate to high heritability was evident for all the traits and was accompanied with high genetic advance for weight of corm, girth number of cormels, weight of cormels, of corm, length of leaf, width of leaf, and petiole length which suggests the role of additive gene action and thus, a high genetic gain is expected from selection of these traits. Moreover, high heritability along with moderate genetic advance for sheath length, height of plant, reveals the presence of additive and non-additive gene action simultaneously. On the other hand, dry matter showed low genetic advance along with high heritability that reflects the presence of non-additive action.

Introduction

Taro (*Colocasia esculenta* var. antiquorum) is one of the oldest and most important tuber crop. It is also known as eddoes type taro, arvi and ghuia. It is grown mostly as staple or subsistence crop throughout the tropics and subtropics. Although this crops is not treated as economically important and was often considered as poor man's crop which is most extensively consumed by the low income group in the rural areas.

India to Southern Asia is the centre of origin of Colocasia from where it has travelled east to all the Island of Occeania, Phillipines, China and Japan although, India is said to the native of taro. Africa ranks first in area and production of Colocasia followed by Asia. In India, it is mainly cultivated in Eastern and Southern States – Faizabad, Varanasi, Sitapur, Sultanpur, and some parts of Jhansi etc. Deoria are the leading districts with regard to Arvi production particularly in Eastern districts of Uttar Pradesh. The objective of the present study, therefore, was to examine the variability, extent of inheritance and character association for various traits of economic importance in 40 genetically diverse

40

HD 39

Int.J.Curr.Microbiol.App.Sci (2017) 6(8): 789-802

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 8 (2017) pp. 789-802
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2017.608.100

Estimation of Heterosis for Growth, Yield and Quality Traits in Bottle Gourd [*Lagenaria siceraria* (Mol.) Standl.]

Deepak Kumar Gautam*, G.C. Yadav, Pushpendra Kumar, Vimlesh Kumar and Manvendra Singh

Department of Vegetable Science, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.), India
**Corresponding author*

Keywords

Bottle gourd, Heterobeltiosis, Economic heterosis and fruit yield per plant.

Article Info

Accepted:
14 June 2017
Available Online:
10 August 2017

ABSTRACT

The present investigation was carried out in two different seasons with aim to assess the heterobeltosis and standard heterosis in bottle gourd. The present study was comprised of 45 crosses developed through diallel mating design using 10 parents namely, NDBG-49-2 (P_1), N. Rashmi (P_2), N. Prabha (P_3), N. Pooja (P_4), Pusa Naveen (P_5), Pb. Komal (P_6), NDBG S-1 (P_7), PBOG-3 (P_8), NDBG-11 (P_9) and Faizabadi Local (P_{10}) at MES, Vegetable Science, NDUA&T, Kumarganj, Faizabad (U.P.) India during *kharif* 2015 (E_1), and *Rabi*, 2015-16 (E_2). The experiments were laid out in RBD with three replications having each experimental unit of single row with spacing of 3.0 m × 0.5 m. The observations were recorded on parents and F_1's for eighteen quantitative traits including six quality traits *viz* days to first staminate flower anthesis, days to first pistillate flower anthesis, node number to first staminate flower, node number to first pistillate flower appearance, days to first fruit harvest, vine length at last picking stage (m), number of primary branches per plant, fruit length (cm), fruit circumference (cm), fruit weight (kg), number of fruits per plant, fruit yield per plant (kg), total soluble solids (°B), ascorbic acid (mg/100 g fresh fruit), reducing sugar (%), non-reducing sugar (%), total sugars (%) and dry matter content in fruit (%).The present heterobeltiosis for fruit yield per plant heterosis range from -3.84 (P_2 x P_7) to 64.49 % (P_5 x P_8) in pooled in over better parent. The best five crosses which showed positive and significant heterosis over better parent were P_3 x P_9 (67.26 %), P_5 x P_8 (64.49 %), P_6 x P_9 (63.58 %), P_4 x P_5 (60.66 %) and P_2 x P_4 (58.76 %) Standard heterosis range from were 9.80 (P_4 x P_8) to 69.17 % (P_3 x P_9) in pooled. The best five crosses which showed desirable and significant positive standard heterosis in the pooled analysis were P_3 x P_9 (69.17 %), P_6 x P_9 (65.45 %), P_3 x P_8 (64.49 %), P_4 x P_5 (60.66 %) and P_7 x P_9 (56.80) for fruit yield per plant indicating that there was a great scope of realizing higher yield in bottle gourd through heterosis breeding.

Introduction

Bottle gourd [*Lagenaria siceraria* (Mol.) Standl, 2n =2x= 22] is an important cultivated annual cucurbitaceous crop grown throughout the country. Being warm season vegetable crop it thrives well in warm and humid climate but at present it's off season cultivation has progressively stretched throughout the year in northern Indian plains. According to De Candolle (1882), bottle gourd has been found in wild form in South Africa and India. However, Cutler and Whitaker (1961) are of the view that probably

39

International Journal of Plant & Soil Science

34(15): 18-22, 2022; Article no.IJPSS.84985
ISSN: 2320-7035

Determination of Association of Yield Components in Tomato (*Solanum lycopersicum* L.)

Himanshu Singh [a*], G. C. Yadav [a≡], Harish Chandra Yadav [b] and Aniket Kumar Verma [c]

[a] Department of Vegetable Science, College of Horticulture and Forestry, A.N.D.U &T, Kumarganj Ayodhya, India.
[b] Department of Fruit Science, College of Horticulture, Banda University of Agriculture and Technology Kumarganj Ayodhya, India.
[c] Department of Vegetable Science, College of Horticulture, Banda University of Agriculture and Technology Kumarganj Ayodhya, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i1531002

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/84985

Original Research Article

Received 04 February 2022
Accepted 14 April 2022
Published 19 April 2022

ABSTRACT

The present investigation was conducted in Randomized Block Design with 38 genotypes (including three checks) of tomato in three replications for thirteen quantitative traits. The objectives were to assess the correlation for fruit yield and yield contributing characters. The association studies showed that fruit yield per plant had highly significant and positive correlation with marketable fruit yield per plant, average fruit weight, equatorial diameter, unmarketable fruits yield per plant and number of fruits per plant at both phenotypic and genotypic levels.

Keywords: Tomato; randomized block design; Solanum lycopersicum; protective food.

1. INTRODUCTION

Tomato is universally treated as "Protective food" and considered as "Poor man's Orange". Tomato is a native of Peru Equador region (Rick, 1969) and having chromosome number 2n=24. Tomato fruits are consumed raw or cooked. It is grown at farm and kitchen garden for slice, soup, sauce,

[≡]*Associate Professor,*
**Corresponding author: E-mail: 77492himanshu@gmail.com;*

International Journal of Plant & Soil Science

34(21): 171-175, 2022; Article no.IJPSS.88416
ISSN: 2320-7035

Response to Selection for the Quantitative Traits in Bottle Gourd [*Lagenaria siceraria* (Mol.) Standl.]

Raja Bhaiya [a*] and G. C. Yadav [a#]

[a] Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology Narendra Nagar (Kumarganj), Ayodhya, Uttar Pradesh, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i2131253

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/88416

Original Research Article

Received 05 May 2022
Accepted 11 July 2022
Published 11 July 2022

ABSTRACT

Present investigations were carried out in bottle gourd to assess the heritability and genetic advance for yield and quality traits. Fifteen hybrids of bottle gourd generated along with their six parents evaluated in a randomized complete block design with three replication at the Main Experiment Station, Department of Vegetable Science A.N.D. University of Agriculture & Technology, Narendra Nagar, Kumarganj, Ayodhya during the season of *Zaid* 2020 and *Zaid* 2021. High heritability was observed for number of primary branch per plant, days to first pistillate flower anthesis, days to first fruit harvest, days to first staminate flower anthesis and vine length during in Y_1, days to first staminate flower anthesis, node number to first pistillate flower appearance, days to first fruit harvest, days to first pistillate flower anthesis and non-reducing sugar during in Y_2, days to first pistillate flower anthesis, days to first staminate flower anthesis, days to first fruit harvest and non-reducing sugar during in pooled. High genetic advance as percent of mean was observed for average fruit weight, number of fruit per plant, fruit yield per plant and reducing sugar during seasons Y_1 and Y_2. The results indicated that these traits had additive gene effect and therefore, these are more reliable for effective selection for their further improvement.

Keywords: Heritability; genetic advance; bottle gourd.

[a] Research scholar;
[a#] Associate Professor;
**Corresponding author: E-mail: rajakaushal9628@gmail.com;*

The Pharma Innovation Journal 2021; 10(8): 84

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(8): 847-849
© 2021 TPI
www.thepharmajournal.com
Received: 25-06-2021
Accepted: 28-07-2021

Hari Shanker Verma
Student, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Shravan Kumar
Assistant Professor, Department of Vegetable Science FASAI Rama University Kanpur, Uttar Pradesh, India

Prashant Verma
Student, Department of Agronomy, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Corresponding Author:
Hari Shanker Verma
Student, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya, Uttar Pradesh, India

Estimation of genetic diversity among the genotypes of brinjal (*Solanum melongena* L.)

Hari Shanker Verma, GC Yadav, Shravan Kumar and Prashant Verma

Abstract
The research experiment was conducted to study genetic diversity for quantitative trai[illegible] genotypes of brinjal (*Solanum lycopersicum* L.). The investigation was conducted during [illegible] at the Main Experiment Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology Narendra Nagar, (Kumarganj), Ayodhya (U.P.) [illegible] D²statistic. The 40 genotypes were grouped into five clusters, indicating the presence of [illegible] the genotypes for different traits. The cluster first had the highest number contai[illegible] followed by cluster II containing ten genotypes. However, the cluster III, IV and V [illegible] genotypes. The maximum intra-cluster distance was recorded within cluster IV [illegible] maximum inter-cluster distance was observed between clusters IV and V (31520.[illegible]) [illegible] mean analysis, the superior and genetically divergent genotypes can be used in [illegible] programme in brinjal.

Keywords: Genetic diversity, *Solanum melongena*, brinjal, cluster

Introduction

Brinjal or egg plant (*Solanum melongena* L.) is one of the most valuable tropical and [illegible] tropical vegetables grown in India. The name brinjal is popular in Indian subcontinents and derived from Arabic and Sanskrit, whereas the name eggplant has been derived from the shape of the fruit of some varieties, which are white and resemble in shape to chicken eggs. It is [illegible] called aubergine (French word) in Europe. Brinjal or guinea Squash belongs to the family Solanaceae (Nightshades) with diploid chromosome number 2n=2x=24. It is known [illegible] different names in different regions of India like bagun (Bengali), ringna (Gujarati), baingan (Hindi). It is popular among people of all social strata and hence, it is rightly called [illegible] vegetable of masses.

Considering the importance of this crop, there is a need for improvement and to develop varieties suited to specific agro-ecological conditions and also for specific end use. Study genetic divergence among the existing genetic stocks provides an opportunity for selecting diverse parents for hybridization. Such parents are expected to produce superior segregates [illegible] combination with others and thus are most valuable for breeders. Moreover, evaluation genetic diversity is important to know the source of genes for a particular trait within available germplasm. D² technique of Mahalanobis appears to be a fruitful approach which based on multivariate analysis and serves as a good index for estimating genetic diversity. Information on genetic divergence among the available genotypes is vital to plant breeders [illegible] an efficient choice of parents for hybridization. It is an established fact that genetically diverse parents are likely to contribute desirable segregates. It is noticed that more diverse the parents greater the chance of obtaining high heterotic F1's and broad spectrum of variability in segregating generations. Hence, this experiment was conducted to study genetic diversity [illegible] quantitative traits among genotypes of brinjal (*Solanum lycopersicum* L.).

Material and Methods

The present experiment was carried out during winter season 2020-21, at the Main Experiment Station, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology (Narendra Nagar), Kumarganj, Ayodhya (U.P.). The experimental [illegible] for the present investigation were comprised of 40 different genotype (39 genotype + [illegible]) of brinjal selected on the basis of genetic variability from the germplasm stock maintained [illegible] the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) India.

International Journal of Plant & Soil Science

34(20): 217-237, 2022; Article no.IJPSS.87793
ISSN: 2320-7035

Evaluation of the Performance of Parental Line and their F_1 Hybrids for Yield and Quality Traits in Brinjal (*Solanum melongena L.*)

Vipin Kumar Maurya [a*] and G. C. Yadav [a]

[a] *Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Ayodhya, India.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i2031147

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/87793

Original Research Article

Received 05 April 2022
Accepted 10 June 2022
Published 15 June 2022

ABSTRACT

Brinjal or eggplant (*Solanum melongena L.*) is one of the most important cultivated solanaceous vegetable, mainly grown for its edible fruits. The present investigation was carried out in order to obtained *per se* performance of parents and their cross combinations for genetic improvement in brinjal. Ten parents were crossed in diallel fashion excluding reciprocal. Half diallel set of crosses and their all possible 45 F_1's (excluding reciprocals) in brinjal (*Solanum melongena L.*)were evaluated in Randomized Complete Block Design (RBD) with three replications for nineteen yield and yield contributing traits during *Kharif* 2020-21 (Y_1) and 2021-22 (Y_2) at the Main Experiment Station (MES) of Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Narendra Nagar, Kumarganj, Ayodhya (U.P.) India. The study revealed that highly significant differences were observed for most of the traits under study. Based on the *per se* performance, the parentP_9 (2.61 kg) registered highest fruit yield per plant followed by P_7 (2.49 kg) in both the year and pooled. The *per se* performance of crosses *viz.*, $P_2 \times P_9$ (3.11 kg), $P_4 \times P_9$(2.66 kg), $P_1 \times P_8$(2.55 kg)and $P_6 \times P_7$(2.42 kg) were produced significantly highest fruit yield per plant than the general mean. These hybrids may be subjected to multi-locational and multi-seasonal trials for their release for commercial cultivation. The findings with respect to salinity tolerance must be correlated to develop the salt tolerant cultivars.

[a]Research Scholar;
[a]Associate Professor;
[*]Corresponding author: E-mail: mauryavipinkr94@gmail.com;

The Pharma Innovation Journal 2021; 10(7): 1146-1148
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(7): 1146-1148
© 2021 TPI
www.thepharmajournal.com
Received: 14-05-2021
Accepted: 18-06-2021

Putan Yadav
M.Sc. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Shiva Nath
Associate Professor, Department of GPB, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Sharvan Kumar
Assistant Professor, Department of Vegetable Science, FASAI, Rama University, Kanpur, Uttar Pradesh, India

Corresponding Author:
Putan Yadav
M.Sc. Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Studies on genetic variability, heritability and genetic advance in garden pea (*Pisum sativum* L. var. hortense)

Putan Yadav, CN Ram, GC Yadav, Shiva Nath and Sharvan Kumar

Abstract
The present experiment was carried out to find out the diversity among the different genotypes with the using 42 diverse genotypes including two checks for quantitative traits and qualitative traits. The study was conducted with the field evaluation of 44 genotypes during 2019-20. The wide range of variation variability among the traits during 2019-20. The observation was recorded Days to 50 per cent flowering, primary branches per plant, node to first flower appears, node to first pod appears, length of pod (cm), pod diameter (cm), number of seeds per pod, number of pods per plant, number of pods per 250g, number of seeds per 250g, weight of seed per 250g, shelling (%), T.S.S.(°B) and pod yield per plant (g). Genotypes involved in this study were genetically diverse and have good breeding value, which confirmed the predictions of analysis of variance. Out of 44 genotypes among eighteen genotypes were produced significantly higher yield than best check PC-521.

Keywords: Garden pea, heritability, variability, PCV, GCV and genetic advance

Introduction
Garden Pea (*Pisum sativum* L. var. *hortense*) belongs to family Leguminaceae sub family Fabaceae and is an important legume vegetable grown throughout world during cool season. It is a self-pollinated crop having diploid chromosome number 2n = 14. It is most extensively cultivated in the temperate regions and restricted to cooler altitudes in the tropics and winter season in the sub tropics. It is highly nutritious and capable of using atmospheric nitrogen. Pea has low nitrogen requirement and does not show any marked response to application of nitrogenous fertilizer. Phosphorus is however essential for growth of nitrogen-fixing organism. On poor soil as well as on soil where the crop is newly grown inoculation of the soil with bacterial culture and adequate manuring with complete fertilizer are essential to increase the yield and to improve the quality of pod. India ranks third in area after China and USSR under pea (vegetable and pulse pea) cultivation. The total area covered by peas is 563 million hectares with the production of 5703 metric tonnes whereas, productivity is 10.12 metric tonnes per hectare (Anonymous, 2019-20 II Estimate). The main objectives in breeding pea crop are yield, regional adaptability, suitable plant type, lodging and shattering resistance disease and insect resistance, environmental stress resistance, quality and effective nitrogen fixation. At present, the yield potential of pea for green pod as well as for the grain is very low and there exists a scope for its improvement. The environmental factor limiting the yield should be considered, while developing genotypes for yield. Pod and grains characteristics, which directly influence the yield and its quality, should be given due consideration. The information usually needed for developing high yielding varieties in a particular species pertains to the extent of genetic variability for desirable traits in the available germplasm. Evaluation of germplasm is the basic tool for identification of important genotypes. The great extent of natural variation available for various characters among the genotypes suggests good scope for improvement in economic traits. Large variability ensures better chance of producing new forms. Variability parameters like genotypic and phenotypic coefficient of variations, heritability and genetic advance, and degree of association between the various characters and direct effect of yield contributing characters on total yield, is of paramount significance in formulating an appropriate breeding strategy aimed at exploiting the inherent variability of the original population. Phenotypic variability changes under different environmental conditions, while genetic variability remains unchanged and more useful to a plant breeder for exploitation in selection or hybridization. Yield is a complex trait controlled by several yield contributing components.

The Pharma Innovation Journal 2021; 10(7): 1577-1581
www.ThePharmaJournal.com
The Pharma Innovation
ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(7): 1577-1581
© 2021 TPI
www.thepharmajournal.com
Received: 07-05-2021
Accepted: 19-06-2021

Satish Kumar Gautam
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

Mohit Lal
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

Corresponding Author:
Satish Kumar Gautam
Ph.D., Scholar, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

Assessment of Correlation coefficients analysis in fenugreek (*Trigonella foenum-graecum* L.)

Satish Kumar Gautam, CN Ram, GC Yadav and Mohit Lal

Abstract
The present investigation entitled "Studies on combining ability, heterosis and gene action in fenugreek (*Trigonella foenum-graecum* L.) for yield and quality attributing traits" at Main Experiment Station (MES) of the Department of Vegetable Science A.N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *rabi* season of 2019-20 (Y_1) and 2020-21(Y_2). The experiment was conducted in a Randomized Complete Block Design (R.B.D.) with three replications on 54 genotypes (40 F_1 + 10 line + 4 testers). Observations were recorded for 11 characters *viz.*, days to 50% flowering, plant height (cm), number of branches per plant, days to maturity, pods length (cm), biological yield per plant (g), harvest-index (%), number of pods per plant, number of seeds per pods, 1000-seed weight (g) and seed yield per plant (g). The findings of the present investigation revealed that phenotypic and genotypic correlation coefficients analysis for yield and quality economic traits.

Keywords: Fenugreek, *Trigonella foenum-graecum* L., phenotypic and genotypic correlation coefficients

Introduction
Fenugreek (*Trigonella foenum- graecum*) belongs to family Fabaceae, 2n=16. It is seed spice as well as leafy vegetable. It has been originated in Egypt. Fenugreek can be grown in the tropical and in temperate regions. It is grown from sea level up to an altitude of 2000 m. There are two species of the genus *Trigonella*, which are of economic importance, *viz.*, *Trigonella foenumgraecum* or the commonly called "methi" and *Trigonella corniculata* or the "kasthuri methi." Fenugreek is an annual herb, 30 to 90 cm tall and has light green leaves which are pinnately trifoliate. The flowers are papillonaceaus and white or yellow in colour and produces stander, beaked pods of approximately 10-15 cm long and each pod contains 10-20 small hard yellowish brown seed possessing smooth and oblong, about 3 mm long, each grooved across one corner, giving them a hooked appearance. India is also known as land of spices. India is one of the dominant producers and exporters of fenugreek. The value-added products of fenugreek such as its seeds, powder and oleoresins are exported to Europe, North America, South Africa and other Asian countries (Anonymous, 2019-20). In India, it occupies an area of about 127 thousand hectare with 184 mt productions with share of 2.4 percent. Fenugreek is mainly grown in the states of Rajasthan, Gujarat, Punjab, Haryana, U.P., M.P. Maharashtra and Tamil Nadu. Rajasthan alone contributes nearly 60 per cent of total area and 80 per cent of total production of the crop in the country. The present investigation was to evaluate the germplasm and unveil the phenotypic and genotypic correlation coefficients studies for yield and yield attributing traits as such information forms the basis for designing breeding strategies to improve the yield potential.

Material and Methods
The experiment was conducted on fenugreek (*Trigonella foenum-graecum* L.) at Main Experiment Station (Vegetable Research Farm), ANDUA&T Kumarganj Ayodhya (U.P.) India, during *rabi* season of 2019-20 (Y_1) and 2020-21(Y_2). The experiment was conducted in a Randomized Complete Block Design (R.B.D.) with three replications and 54 genotypes (40 F_1 + 10 line + 4 testers). The crop was planted in row length spaced 30 cm. apart where, 10 cm. plant to plant spacing was maintained. The experimental plant material for present investigation was comprised of 40 hybrid developed by crossing 10 line (NDM-3, NDM-4, NDM-8, NDM-10, NDM-5, NDM-63, NDM-14, NDM-23, and NDM-19 with 4 testers PEB, NDM-2, Hisar Sonali (check) and NDM-1.The observations were recorded on five plants randomly selected from each genotype in each replication on eleven characters, *viz.*, days to

The Pharma Innovation Journal 2021; 10(7): 1582-1584
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(7): 1582-1584
© 2021 TPI
www.thepharmajournal.com
Received: 15-05-2021
Accepted: 23-06-2021

Mohit Lal
Ph.D., Research Scholar, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

CN Ram
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

GC Yadav
Associate Professor, Department of Vegetable Science, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

OP Rao
Professor, College of Horticulture and Forestry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, Uttar Parades, India

Corresponding Author:
Mohit Lal
Ph.D., Research Scholar, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Parades, India

Studies on heritability and genetic advance for the quantitative traits in Bottle gourd [*Lagenaria siceraria* L. (Moll.) Standl.]

Mohit Lal, CN Ram, GC Yadav and OP Rao

Abstract
Bottle gourd [*Lagenaria siceraria* L. (Moll.) Standl.] is an important tropical species characterized by a wide range of diversity and a low yield, mainly due to number of selection for improved varieties. The present investigations were carried out at the Main Experiment Field, Vegetable Science, ANDUA&T, (Kumarganj), Ayodhya, during the season of *Zaid* 2019 and 2020. The experiment laid out in randomized complete block design (RBD) with three replications. High heritability coupled with high genetic advance as per cent of mean was observed for fruit length (cm), reducing sugar (%), total sugar (%), and days to first male flower anthesis (days), node number to first female flower appearance (days), primary branches per plant (days), total soluble solids (%) and non-reducing sugar (%). The results indicated that these characters had additive gene effect and therefore, these are more reliable for effective selection for their further improvement.

Keywords: Genetic advance and heritability in *Lagenaria siceraria* L.

Introduction
Bottle gourd [*Lagenaria siceraria* L. (Moll.) Standl.] is an important cucurbitaceous crop having range of uses and is largely cultivated in the tropics and subtropics for its edible fruits. Bottle gourd is one of the largest produced cucurbit vegetables in the world having chromosome number of 2n = 22. The genus *Lagenaria* is derived from the world *Lagena*, meaning bottle. It is also known as Calabash, Doodhi and Lauki in different parts of India (Deore *et al.*, 2009) [4]. Bottle gourd is a monoecious and cross pollinated crop in large amount of variation has been observed for many economically important characters. The fruits of bottle gourd are used are for making sweets, halva, kheer, petha, burfi and pickles. Kofta is a most popular preparation of bottle gourd. As a vegetable it is easily digestible therefore used even by patients. Fruit has cooling effect, cardiatonic and diuretic. The fruit is rich in pectin also, which showed good prospects for jelly preparation. A decoction made from the leaf is a very good medicine for jaundice. The fruit has cooling effect, it is a cardiotonic and diuretic, good for people suffering from biliousness, indigestion and convalescences *i.e.*, regain health after illness. The pulp is good for overcoming constipation, cough and night blindness and as an antidote against certain poisons. In addition, the seeds and seed oil are edible. The fruits contain 96.3 per cent moisture, 2.9 per cent carbohydrate, 0.2 per cent protein, 0.1 per cent fat, 0.5 per cent mineral matter and 11 mg of vitamin C (Ascorbic acid) per 100 g fresh weight (Thamburaj and Singh, 2005) [9]. Bottle gourd was one of the first plant species to be domesticated for human use, providing food, medicine and a wide variety of utensils and musical instruments made from the large hard shelled mature fruits. It travelled to India, where it has evolved into numerous local varieties and from India to China, Indonesia and New Zealand. At present time, the annual running or climbing monoecious vine crop is cultivated throughout the tropical and subtropical regions of the world for food and useful gourds (Whitaker and Davis, 1962) [2]. Dry hard shells of the fruits have been used for making a wide range of articles of common use, including bowls, bottles, containers, floats for finishing nets and musical instruments (Wikipedia, 2018) [12].
The genetic parameters such as heritability, genetic advance provide effective tools in hand of a breeder to select a genotype having the most desirable characters for yield. Many of the quantitative characters such as number of fruits per plant and yield per plant are highly influenced by environment conditions to use partitioning the overall heritable and non-heritable components which will be of the immense help in any planned breeding programme.

Journal of Pharmacognosy and Phytochemistry 2017; 6(2): 265-267

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(2): 265-267
Received: 05-01-2017
Accepted: 06-02-2017

Mohit Kumar
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SN Singh
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RR Yadav
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Doharey
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Abhishek Kumar
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

DP Singh
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Surender Kumar
Department of Plant Pathology, College of Agriculture, Sam Higginbottom Institute of Agriculture Technology and Sciences, Allahabad, Uttar Pradesh, India

Correspondence
Mohit Kumar
Department of Extension Education, College of Agriculture, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Constraints analysis of mango growers in Saharanpur district of Uttar Pradesh

Mohit Kumar, SN Singh, RR Yadav, RK Doharey, Abhishek Kumar, DP Singh and Surender Kumar

Abstract
A study was conducted in Rampur Maniharan Block of district Saharanpur selected purposely. A total number of 100 Mango growers were selected through random sampling from five villages. The structured schedule was developed keeping in view the objectives and variable to be studied. The respondents were contacted personally for data collection. Out of 13 common problems the maximum number of the respondents 95% with adopt a rank of first were agreed with the statements that "Low price for produce" is the common problem, followed by "High cost of chemical fertilizers" 92% at ranks second, "Lack of Education" 91% at rank third, respectively. The maximum number of the respondents 85% with adopt a rank of first were agreed with the statements that "Flexible sources of credit" is the common problem, followed by "Training for Mango grading" 82% at ranks second, "Mango processing unit should establish" 79% at rank third, "Efforts should be made for providing fertilizers on appropriate rate" 78% at rank fourth, respectively.

Keywords: Adoption, constraints, Practices and suggestion

1. Introduction
Mango (*Mangifera indica* L.) is one of the most important fruit of India and as the "king of fruits". It belongs to the family *Anacardiaceae* and genus *Mangifera and species indica*. It is indigenous to Indo-Burma region. It is under cultivation in India for more than 4000 years and hence conspicuous bonds have been between the fruit and cultural history of the country. India still dominates the world mango production and rank first with a total production of 18431.0 thousand Million tonnes from an area of 2516.0 thousand ha. In India, mango is cultivated almost all the states, where as Uttar Pradesh is leading state in production with 4300.98 thousand Million tonnes from an area of 262.16 thousand ha. (NHB Data base, 2014) [5]. India has the richest collection of mango cultivars. Mango is recognized as one of the choicest and well accepted fruit all over the world due to its taste, flavour, attractive colour and nutritive value. It plays important role in balancing the diet of human being by providing about 64-66 calories per hundred grams of ripe fruits. It is a good source of vital protective nutrients like vitamins such as vitamin A (1400 I.U.), and C. Mango fruit contains 73.0-86.7 per cent moisture, 11.6-24.3 per cent carbohydrate, 0.3-1.0 per cent protein, 0.1-0.8 per cent fat, 0.3-0.7 per cent mineral, 650-25900 µg vitamin 'A' and 3-83 mg vitamin 'C' per 100 gram fruit. Seed kernels contain 9.5 per cent protein, 8-12 per cent fat, 79.2 per cent starch, 2 per cent mineral matter and 2 per cent fibers (Dock Worth, 1979) [2]. Raw fruits are also used for making chutney, amchur, pickles and juices. The ripe fruits are also utilized for preparing several productions like ready to serve, nectar, squash, panna syrup, mango leather, mango powder, toffee, jams, jelly etc. Maximum 57.50 per cent mango orchardists have full adoption of 10 m x 10 m planting distance. Most of the orchardists have full adoption of Dashehari, Langra and Chausa varieties for plantation in mango orchard (Tanwar, 2013) [6]. In fertilizers and manure application, most of the mango growers were have full adoption. Most of orchardists have partial adoption of ring and furrow method for irrigation, while 67.50 orchardists have full adoption of flood method for irrigation, There was 100 per cent full adoption in wettable sulpher, 97.50 per cent karathan and hexaconazal for disease control. Most of the orchardists have full adoption in Monocrtophos, Endosulphan and Imidacloprid for pest management. Maximum farmers were having full adoption in grading and packing of mango, while few orchardists have partial adoption in processing practices in mango. The 100 per cent mango orchardists have full adoption in Mandi samities for marketing of fruits, while most of the orchardists have no adoption of direct sale of fruits to consumers and whole sellers in same town, village and export of fruits. Mango post-harvest diseases cause maximum losses in the quality and marketing of fresh mango fruits.

Int.J.Curr.Microbiol.App.Sci (2017) *6*(3): 2032-2037

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 3 (2017) pp. 2032-2037
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.603.231

Communication and Psychological Behavior of the Pigeon Pea Growers in Chitrakoot District, India

Kaushik Prasad[1], R.K. Doharey[1], S.N. Singh[2], Rahul Kumar Singh[1], Manoj Kumar[1*] and Atul Kumar[1]

[1]Department of Extension Education, College of Agriculture, N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad (U.P.) 224229, India
[2]SMS (Agricultural Extension) KVK Mashodha Faizabad (U.P.), India
**Corresponding author*

Keywords
Socio-economic profile, Knowledge and adoption, Awareness, Communication technology etc.

Article Info
Accepted:
20 February 2017
Available Online:
10 March 2017

ABSTRACT

This study was conducted in Karwi block of Chitrakoot district by conducting personal interview with 100 respondents which were selected through random sampling technique. There were 65 percent respondents found in middle age group and observed to be literate (67%), belonging to backward caste (70%), residing in nuclear families (63%). The maximum respondents (63 %) were having small farmers land holding and agriculture was observed as main occupations (88%). The 55 per cent respondents were found such who had family annual income Rs. 26001-79000. The mobile (100%) were observed as main communication media. A maximum number of respondents were found in low level of scientific orientation (41%), and medium level of economic motivation and risk orientation with 80 per cent and 55 per cent respectively.

Introduction

Red gram has wide adaptability and low input requirements mostly grown in *kharif*. The heavy shedding of leaves adds considerable organic matter to the soil. Pigeonpea has multiple uses such as tender green seeds used as vegetables, stem and roots as fuel wood, crushed dry seeds as animal feed and to make huts, baskets etc. besides its main use as dhal. It has been recognized as a valuable source of protein (17.9 to 24.39/100g) particularly in the developing countries where majority of the population depends on the vegetarian foods for meeting its dietary requirements (Ali and Kumar, 2005). It has nitrogen fixing ability, and also play an important role in sustaining intensive agriculture by improving physical chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Pigeonpea is one of the important pulse crops of India and 91% of the world's pigeonpea is produced in India. Myanmar is the second largest producer of pigeon pea with 15% of global production followed by lesser producers Kenya, Uganda, and Malawi. The productivity of pigeonpea in India (7.99q/ha)

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 11 (Special-IV) : 2639-2643 (2016)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

EFFECT OF INDEPENDENT VARIABLES ON KNOWLEDGE EXTENT OF FARMERS ABOUT PIGEON PEA CROP

Kaushik Prasad[1], R.K.Doharey[1], S.N. Singh[2], R.K. Singh[1], R.K. Pandey[1], S. Atarey[1], D. Singh[3]

[1]Department of Extension Education, N.D.U.A.T.Kumarganj. Faizabad-224229 [2]Subject Matter Specialist, K.V.K., Masodha, Faizabad, [3]Dept. of Plant Pathology

E-mail : rahulrrrext91@gmail.com

ABSTRACT

This study was conducted in Karwi block of Chitrakoot district by conducting personal interview with 100 respondents which were selected through random sampling technique. There were 65 percent respondents found in middle age group and observed to be literate (67%), (70%) respondents belonging to backward caste, 63 per cent residing in nuclear families. The maximum respondents (63 %) were having small farmers land holding and agriculture was observed as main occupations (88%). The 55 per cent respondents were found such who had family annual income Rs. 26001-79000. The majority of respondents (66%) were observed overall material possession in medium level(62 to 76 score). A maximum number of respondents were found in low level of scientific orientation (41%), medium level of economic motivation and risk orientation with 80 per cent and 55 per cent respectively. Besides, among all 14 agricultural practices of pigeon pea cultivation, time of sowing (93%) were rank at 1st as far as knowledge possessed by the respondents were concerned. Out of 14 variables studied the variables *i.e.* Knowledge extent of scientific pigeon pea cultivation practices, education, Annual income and social participation was found highly significant and positively correlated with knowledge extent.

Key words : *Socio-economic profile, knowledge, communication technology etc.*

Red gram *[Cajanus cajan (L.) Millsp.]* belongs to family Leguminosae. Numerous nodules are present on roots, these nodules contain rhizobium bacteria, which fixes atmospheric nitrogen. The flowers are self-pollinated but cross-fertilization may also occur to some extent. The fruit of the red gram is a pod. Seeds are round or lens shaped. Numerous species of *Cajanus* are known, differing in height, habit, time of maturity, colour, size and shape of pods and seeds. All these cultivated types belong to two categories, one of *Cajanus cajan var.* bicolor: This group includes late maturing varieties, having tall bushy plants and bear flowers at the end of the branches. The pods are relatively longer and contain 4-5 seeds, and other *Cajanus cajan var. flavus*. This group includes early maturing varieties, having smaller plants and flowers at several points along the branches. The pods are also shorter which bear 2-3 seeds.

Red gram has wide adaptability and low input requirements mostly grown in *kharif*. The heavy shedding of leaves adds considerable organic matter to the soil. Pigeon pea has multiple uses such as tender green seeds used as vegetables, stem and roots as fuel wood, crushed dry seeds as animal feed and to make huts, baskets etc. besides its main use as dhal. It has been recognized as a valuable source of protein (17.9 to 24.39/100g) particularly in the developing countries where majority of the population depends on the vegetarian foods for meeting its dietary requirements (Ali and Kumar, 2005). It has nitrogen fixing ability, and also play an important role in sustaining intensive agriculture by improving physical chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Pigeon pea is one of the important pulse crops of India and 91% of the world's pigeon pea is produced in India. Myanmar is the second largest producer of pigeon pea with 15% of global production followed by lesser producers Kenya, Uganda, and Malawi. The productivity of pigeon pea in India (7.99q/ha) is far below the average productivity (8.48 q/ha) of world. In India, it occupies an area of about 4.09 million hectares producing 3.27 million tons with an average productivity of 7.99 q/hectare (Anonymous 2010).

Pigeon pea is the 4th ranked pulse crop in the world. In India, pigeon pea is the 2nd most important pulse crop after chickpea. Besides India, it is also grown in south East Asia, Africa, and America. In India, production of pigeon pea was 3.17mt, on area of 3.88 m ha. with yield of 817 kg/ha. (Anonymous, 2014). In India, the crop is mainly grown in Andhra Pradesh, Bihar, Uttar Pradesh, Karnataka, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Tamilnadu. In Uttar Pradesh, it is grown 311.0 thousand ha area producing 325.0 thousand tons, with an average yield of 1040 kg/ha (Anonymous, 2014).

Pigeon pea in India is the most important pulse crop which is cultivated in the gross cropped area (3.58 million hectare) under pulses providing 20% of the national pulse production (2.51 million tons). Besides being rich source of protein, they are also important for sustainable agriculture, enriching the soil through biological nitrogen fixation. Pigeon pea is one of the most important legumes grown in Uttar Pradesh which has 10.61% area (0.38 million hectare) and 13.87% in terms of production (0.38 million tons) in the country. The productivity of pigeon pea in Uttar Pradesh is 9.82 q/ha, which is lower than the

Int.J.Curr.Microbiol.App.Sci (2017) *6*(3): 2021-2031

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 3 (2017) pp. 2021-2031
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.603.230

Socio Economic Profile of the Sugarcane Growers in Sitapur District (U.P.), India

Jagatpal[1], R.K. Doharey[1], Kaushik Prasad[1], S.N. Singh[2], Rahul Kumar Singh[1] and Manoj Kumar[1]

[1]Department of Extension Education, College of Agriculture, N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad (U.P.) 224229, India
[2]SMS (Agricultural Extension), KVK Mashodha, Faizabad (U.P.), India
**Corresponding author*

Keywords

Socio-economic profile, Knowledge and adoption, Awareness, etc.

Article Info

Accepted:
20 February 2017
Available Online:
10 March 2017

A B S T R A C T

This study was conducted in Khairabad block of Sitapur district (U.P.) by conducting personal interview with 100 respondents which were selected through random sampling technique from 5 sample villages on the basis of majority of sugarcane grower. There were the majority of the respondents 60% were found in middle categories (38-59) of age group, like this 68 % literate, 99% married, 67% other backward caste, 100% Hindu religion, 54% nuclear family, 67% medium family size (5-11 members), 47% marginal land holding size (less than 1 ha.), 78% agriculture main & 67% subsidiary occupation, 80% annual income (45001-172000), 41% mixed houses, , 71% overall material possession (41-84 equipment).

Introduction

Sugarcane is an important cash crop grown all over the world. It belongs to the grass family poaceae. Sugarcane is the world largest crop. In 2012 FAO estimate it was cultivated on about 26.00 million hectare land, in more than 90 countries, with a worldwide harvest 1.83 billion tonnes. India is the largest producer of sugarcane in the world. The next five major producers in amount production are Brazil, China, Thailand, Pakistan and Mexico.

Sugarcane is a tropical, perennial grass that forms lateral shoots at the base to produce multiple stems, typically three to four meter height and about five centimeters diameter. Sugarcane is a cash crop, but it is also used as livestock fodder.

Sugarcane is moderately non-sunny weather loving plant is grown in two distinct climate regions; the tropical and subtropical. The total area under sugarcane in India is 5.06 million hectare with 356.56 million tonnes production in 2014-15, out which 70% lies in the subtropical region and the remaining 30% in the tropical belt.

Major sugarcane growing states in India are U.P, Maharashtra, Karnataka, Tamilnadu, Andhra Pradesh and Punjab etc., but northern India having subtropical climate. The important sugarcane growing states of the northern region are U.P, Haryana, Punjab, Bihar and Jharkhand. Uttar Pradesh is the highest sugarcane producing State in sub-

EXCELLENT PUBLISHERS

Int.J.Curr.Microbiol.App.Sci (2017) *6*(3): 2013-2020

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 3 (2017) pp. 2013-2020**
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2017.603.229

Communication and Psychological Behavior of the Sugarcane Growers in Sitapur District (U.P.), India

Jagatpal[1], R.K. Doharey[1], Kaushik Prasad[1], S.N. Singh[2], Rahul Kumar Singh[1] and Manoj Kumar[1]

[1]Department of Extension Education, College of Agriculture, N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad (U.P.) 224229, India
[2]SMS (Agricultural Extension), KVK Mashodha, Faizabad (U.P.), India
**Corresponding author*

Keywords

Socio-economic profile, Knowledge and Adoption, Awareness, etc.

Article Info

Accepted:
20 February 2017
Available Online:
10 March 2017

ABSTRACT

This study was conducted in Khairabad block of Sitapur district (U.P.) by conducting personal interview with 100 respondents which were selected through random sampling technique from 5 sample villages on the basis of majority of sugarcane grower. The majority of the respondents 41% institutional membership, 71% overall material possession (41-84 equipment), gram pradhan I ranked formal sources, family member I ranked informal sources, mobiles I ranked mass media, 54% medium (20-23) economic motivation, 54% medium (23-27) scientific orientation, 63% medium (21-25) risk orientation, 33.66% fully knowledge and 26.35% partially knowledge of respondents about IPM practices in sugarcane crop, 28.29% high, 29.66% medium and 40.54% low adoption of respondents about IPM practices in sugarcane crop.

Introduction

Sugarcane is an important cash crop grown all over the world. It belongs to the grass family poaceae. Sugarcane is the world largest crop. In 2012 FAO estimate it was cultivated on about 26.00 million hectare land, in more than 90 countries, with a worldwide harvest 1.83 billion tonnes. India is the largest producer of sugarcane in the world. The next five major producers in amount production are Brazil, China, Thailand, Pakistan and Mexico.

Sugarcane is a tropical, perennial grass that forms lateral shoots at the base to produce multiple stems, typically three to four meter height and about five centimeters diameter.

Sugarcane is a cash crop, but it is also used as livestock fodder.

Sugarcane is moderately non-sunny weather loving plant is grown in two distinct climate regions; the tropical and subtropical. The total area under sugarcane in India is 5.06 million hectare with 356.56 million tonnes production in 2014-15, out which 70% lies in the subtropical region and the remaining 30% in the tropical belt.

Major sugarcane growing states in India are U.P, Maharashtra, Karnataka, Tamilnadu, Andhra Pradesh and Punjab etc., but northern

Int.J.Curr.Microbiol.App.Sci (2017) *6*(1): 933-940

EXCELLENT PUBLISHERS

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 1 (2017) pp. 933-940**
Journal homepage: http://www.ijcmas.com

Original Research Article http://dx.doi.org/10.20546/ijcmas.2017.601.110

Use of Motivational Sources of State Agricultural University Students about Career Preferences

Shesh Narain Singh[1], S.P. Sonkar[2], R.K. Doharey[3], R.K. Singh[4] and Manoj Kumar[5*]

[1]SMS (Agril.Ext.), KVK, Masodha, Faizabad-224201, India
[2]SMS (Agril.Ext.) KVK, Jaunpur, India
[3]Department of Ext. Edu., N.D.U.A. and T. Kumarganj Faizabad (U.P.), India
[4]SMS (Hort.) KVK, Ballia, India
[5]Department of Ext. Edu., N.D.U.A. & T. Kumarganj Faizabad (U.P.), India
**Corresponding author*

Keywords
Socio-economic profile, Motivation, SAUs students, career preferences.

Article Info
Accepted:
28 December 2016
Available Online:
10 January 2017

ABSTRACT

The study was conducted in 4 main agricultural universities in Uttar Pradesh, by interviewing 300 respondents who were selected through proportionate random sampling technique on the criteria of having four year degree programme of B.Sc.(Ag.), two year degree programme M.Sc.(Ag.) and three year degree programme Ph.D.(Ag.). The study depicted that the highest number of respondents in age category of 22 to 26 years belonged to nuclear families (79%) and having 5-10 members in their families (72%) Except 7 per cent respondents all were unmarried and backward caste respondents were more in comparisons to other categories of caste. The economic motivation, risk orientation and value orientations were observed of medium levels. The mobile phone is most useful of communication media. The agriculture was observed as main occupation of majority of the respondent's families and having annual income of Rs. 100001 to 200000 (31%). The 51% respondents were found having pucca type houses, 35% of the respondents was found in the land holding category of small farmers. 64.66 percent medium level of decision pattern of Father. The maximum number of respondents was observed in medium category of communication technology use in day and most usefulness of communication technologies in career preferences was mobile phone. The majority Purpose in use of communication technology was 'computer information retrieval or data updating' at ranked first. The father followed by mother, brother, friends, relative mean score value 2.11, 1.03, 0.71, 0.60 and 0.60 respectively were found to be important motivational sources among all.

Introduction

Agriculture is still the largest employer of India. However, there was not much education regarding the same in the past. Agricultural education is now given importance so that the farmers can adopt environmentally and technologically advanced faming tactics and consequently increase productivity as well as profitability.

Int.J.Curr.Microbiol.App.Sci (2017) *6*(2): 1360-1365

EXCELLENT PUBLISHERS

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 6 Number 2 (2017) pp. 1360-1365
Journal homepage: http://www.ijcmas.com

Original Research Article http://dx.doi.org/10.20546/ijcmas.2017.602.154

Adoption Level of Zinger Growers Regarding Zinger Cultivation Practices

Deepak Kumar Verma[1], R.K Dohrey[2], Shesh Narain[3], Garima Tiwari[4], Manoj Kumar[2*] and Ravi Kumar Pandey[2]

[1]Department of Agricultural Extension, College of Agriculture, SVPUA&T, Modipuram, Meerut (U.P) 250110
[2]Department of Extension Education, NDUA&T, Kumarganj, Faizabad- 224229 (U.P.), India
[3]S.M.S (Agriculture Extension) K.V.K Mashodha Faizabad (U.P), India
[4]IARI, Division of Agricultural Extension, New Delhi – 110012, India
**Corresponding author*

Keywords
Adoption level, Cultivation Practices.

Article Info
Accepted:
22 January 2017
Available Online:
10 February 2017

ABSTRACT

The study was conducted in Bundelkhand Region during the year 2010-2011, To know the adoption level of the Zinger growers regarding Zinger cultivation practices. For this purpose 4 villages' peripheral and 4 distant villages were randomly selected from Bundelkhand region. From each village 10 respondents were purposively selected. Thus total sample size was of 80 Zinger growers for the study. It was observed that 36.04% peripheral farmers adopting improved varieties, 51.87% field preparation practices, 70.83% sowing rainfed and irrigated conditions, 58.33% adopting optimum seed rate, 53.33% line sowing, 69.16% sowing optimum depth, 50.83% adopting thinning practices, 49.16% adopted balance use of fertilizers and 34.16% adopting storage practices. While 33.91% distant farmers were using improved varieties, 43.95% field preparation, 45.83% sowing Zinger in rainfed and irrigated conditions, 40.83% using optimum seed rate, 44.16% line sowing adopted, 41.66% sowing optimum depth, 39.16% adopting thinning practices, using optimum irrigation, 41.66% using balance fertilizers and 22.33% adopting storage practices. There were minor difference found in between regarding peripheral farmers and distant farmers regarding adoption of plant protection measure in Zinger cultivation.

Introduction

India has been the "Home of spices" since time immemorial. It is the world's largest producer, consumer and exporter of seed spices which are being cultivated widely in the country over different agro-climatic zones. Zinger is used as a crude drug to enhance the body's resistance and is prescribed in amebiasis. It is a potent antimicrobial agent. Due to its multiple properties, ginger is used to cure cough, gastric problem, stomachache, bloat as well as urinary troubles. In view of the above medicinal and nutritional properties of Zinger, the production technology of zinger cultivation is essential. Keeping this fact in view the present study was conducted in Jhansi district. Spices are extensively used as flavoring agent in various food products and in pharmaceutical industries in preparation of various Ayurvedic medicines. The aromas in

VOL VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

KNOWLEDGE ABOUT FORMATION, IMPLEMENTATION AND FUNCTIONING OF DIFFERENT WOMEN SHGS IN KANPUR DEHAT DISTRICT (U.P.)

Shalu gautam[1], R.K. Doharey[2], and Prakash Singh[3]
1,2&3 Department of Extension Education, College of Agriculture, NDUA&T,Kumarganj, Ayodhya(U.P.)-224229

Abstract
The study was conducted in Akbarpur block of Kanpur Dehat district selected purposively. A total number of 100 respondents of women SHG were selected purposively which were selected from 20 Villages randomly. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The data revealed that the maximum number of women SHG members (62%) had medium level of knowledge about formation, implementation and functioning of different women SHG followed by low (20%), high (18%) respectively. It is evident from the values of correlation coefficient as appeared in that out of 17 variables. The 4 variables *viz.*, annual income, social participation, extension contact, awareness about of ICT tools, were found to be significant and positively correlated with degree of knowledge about formation, implementation and functioning of different women SHG at 0.05% probability and one variable 'caste' was found to highly significant and negatively correlated with degree of knowledge about formation, implementation and functioning of different women SHG at 0.01% probability. The variables like education, family type, family size, housing pattern, scientific orientation, and accessibility to computer were found to be non-significant but positive correlated with degree of knowledge about formation, implementation and functioning of different women SHG. The variable like 'caste' was found highly significant and negatively correlated with degree of knowledge about formation, implementation and functioning of different women SHG. This led to conclusion that out of 17 variables 4 variables which were significant influenced the degree of knowledge about formation, implementation and functioning of different women SHG means that as the annual income, social participation, extension contact, awareness about of ICT tools, etc.

Key words: Knowledge about formation, implementation and functioning of different women SHGs.

Introduction

The Self-Help Groups (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common Problems through self-help and mutual help. The SHG promotes small savings among its members and these savings are kept with a bank. This common fund is in the name of the SHG. The SHG is a group formed by the community which has specific number of members like 15 or 20. Usually, the number of members in one SHG does not exceed twenty. In such a group the poorest would come together for emergency, disaster, social reasons economic support to each other have ease of conversation, social interaction and economic interactions.

A self-help group is defined as a "self-governed, peer-controlled information group of people with similar socio-economic background and having a desire to collectively perform common purpose. The Self-help groups have been able to mobilize small savings either on weekly or monthly basis from persons who were not expected to have any savings. They have been able to effectively recycle the resources generated among the members for meeting the productive and emergent credit needs of members of the group.

The SHGs are novel and innovative organizational setup in India for the women upliftment and welfare. All women in India are given chance to join any one of SHGs for training and development, so as to be prospective entrepreneur and skilled worker. The SHGs are promoted by the Government as if women in India may not be resourceful enough to be entrepreneurs. When the SHGs arrange training facilities to carry out certain kind of work which are suitable for women in India, bank must arrange financial assistance to carry out manufacturing and trading activities, arranging marketing facilities while the Governments will procure the product of SHGs, arrange for enhancing the capacity of women in terms of leadership quality and arranging for the management of SHGs by themselves so as to have administrative capacity. As a social movement with government support SHGs become more or less a part and parcel of the society.

The Government has been implementing various programmes which support women programmes to take up new venture and start self-employment, which has been categorized under four heads:

- Empowering strategies: Indira Mahila Yojana (IMY) Mahila Samiridhi Yojana MSY: DWCRA.
- Employment and income generation: TRYSEM; Support for Training and Employment Programme (STEP) SGSY, SJSRY, Urban Self Employment Programme (USEP), JRY.
- Welfare and support services: Hostels for Working Women (HWW) Short Stay Homes (SSH), Swadhar Creches/day Care Centres for the Children of Working and Ailing Mothers.

Other enabling measures: Rashtriya Mahila Kosh (RMK), a national level mechanism to meet micro credit needs of poor and asset less women in the informal sector also known as the National Credit Fund for Women (NCFW). The total number of Self Help Groups (SHGs) promoted under National Rural Livelihoods Mission (NRLM) was 1864742 as on 31.03.2014. Their number increased to 2305513 as on 31.07.2015, recording a growth of 440771 SHGs as compared to 31.03.2014. In percentage terms, the progress made in the number of SHGs between 31.03.2014 and 31.07.2015 was 23.64%.

The SHGs have given a new lease of life to the women in villages for their social and economic empowerment. Economic development plays an important role in the development and growth of any society. The importance of promoting women to engage in economic activities is being increasingly realized in all developing countries which has two folds: of to empower the women by bringing them into the mainstream developing and improving their economic status and to provide new employment opportunities by way of income generation, self-employment and entrepreneurship to women for different socio-economic sector.

The constitution of SHGs is sometimes exclusively on particular social groups or a mix. The impact of SHGs on social harmony has also been mixed while it has been observed that the groups with mixed membership had group's leaders that came from a variety of the social groups. SHGs have impact on the community at large. These have been few instances of significant contributing to education, family planning, eradication of child labour and hygiene. The SHGs have helped their members and their communities by taking a leadership role in community development, hence SHG are perceived to be a guiding force for village. The loans that SHG members received are intended to improve their livelihood so that they can receive greater and steadier cash flows.

The concept of Self-help groups had its origin in the co-operative philosophy and the co-operators by and large, including the National Federations in the credit sector, could not think of any better SHG than a primary co-operative credit society itself, as SHG are small and economically homogenous affinity groups of rural poor, they are

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SOCIO ECONOMIC PROFILE OF THE WOMEN SHGS IN KANPUR DEHAT DISTRICT (U.P.)

R.K. Doharey, Shalu gautam, Prakash Singh, Kamal Kishore and Shagufta wasim
Department of Extension Education, College of Agriculture,N.D.U.A &T., Kumarganj, Ayodhya (U.P.)- 224229

Abstract

The study was conducted in Akbarpur block of Kanpur Dehat district selected purposively. A total number of 100 respondents of women SHG were selected purposively which were selected from 20 Villages randomly. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The data revealed that the maximum number of women SHG respondents *i.e.* (61%) were found in middle age (27-45years).The majority of the categories belonged to scheduled caste, the dominancy of joint family system (55%) was observed. The women SHG members (60%) had medium family size (5 to 7 members) in their families and possess small land holding position. The majority of women SHG members (59%) reported agriculture as their main occupation. respondents 68% were found such who had earning annual income of (Rs. 25001-2750000) and (62%) respondents reported having mixed type house, respectively. The maximum of women SHG members (62%) were found members of one organization, (25%) member of two organizations and (13%) member of more than two organizations or office bearer. The cycle has immersed most important transportation.

Key words: Socio-economic profile and awareness etc.

Introduction

The Self-Help Groups (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common problems through self-help and mutual help. The SHG promotes small savings among its members and these savings are kept with a bank. This common fund is in the name of the SHG. The SHG is a group formed by the community which has specific number of members like 15 or 20. Usually, the number of members in one SHG does not exceed twenty. In such a group the poorest would come together for emergency, disaster, social reasons economic support to each other have ease of conversation, social interaction and economic interactions.

A self-help group is defined as a "self-governed, peer-controlled information group of people with similar socio-economic background and having a desire to collectively perform common purpose. The Self-help groups have been able to mobilize small savings either on weekly or monthly basis from persons who were not expected to have any savings. They have been able to effectively recycle the resources generated among the members for meeting the productive and emergent credit needs of members of the group.

The SHGs are novel and innovative organizational setup in India for the women upliftment and welfare. All women in India are given chance to join any one of SHGs for training and development, so as to be prospective entrepreneur and skilled worker. The SHGs are promoted by the Government as if women in India may not be resourceful enough to be entrepreneurs. When the SHGs arrange training facilities to carry out certain kind of work which are suitable for women in India, bank must arrange financial assistance to carry out manufacturing and trading activities, arranging marketing facilities while the Governments will procure the product of SHGs, arrange for enhancing the capacity of women in terms of leadership quality and arranging for the management of SHGs by themselves so as to have administrative capacity. As a social movement with government support SHGs become more or less a part and parcel of the society.

The Government has been implementing various programmes which support women programmes to take up new venture and start self-employment, which has been categorized under four heads:

- Empowering strategies: Indira Mahila Yojana (IMY) Mahila Samiridhi Yojana MSY: DWCRA.
- Employment and income generation: TRYSEM; Support for Training and Employment Programme (STEP) SGSY, SJSRY, Urban Self Employment Programme (USEP), JRY.
- Welfare and support services: Hostels for Working Women (HWW) Short Stay Homes (SSH), Swadhar Creches/day Care Centres for the Children of Working and Ailing Mothers.

Other enabling measures: Rashtriya Mahila Kosh (RMK), a national level mechanism to meet micro credit needs of poor and asset less women in the informal sector also known as the National Credit Fund for Women (NCFW). The total number of Self Help Groups (SHGs) promoted under National Rural Livelihoods Mission (NRLM) was 1864742 as on 31.03.2014. Their number increased to 2305513 as on 31.07.2015, recording a growth of 440771 SHGs as compared to 31.03.2014. In percentage terms, the progress made in the number of SHGs between 31.03.2014 and 31.07.2015 was 23.64%.

The SHGs have given a new lease of life to the women in villages for their social and economic empowerment. Economic development plays an important role in the development and growth of any society. The importance of promoting women to engage in economic activities is being increasingly realized in all developing countries which has two folds: of to empower the women by bringing them into the mainstream developing and improving their economic status and to provide new employment opportunities by way of income generation, self-employment and entrepreneurship to women for different socio-economic sector.

The constitution of SHGs is sometimes exclusively on particular social groups or a mix. The impact of SHGs on social harmony has also been mixed while it has been observed that the groups with mixed membership had group's leaders that came from a variety of the social groups. SHGs have impact on the community at large. These have been few instances of significant contributing to education, family planning, eradication of child labour and hygiene. The SHGs have helped their members and their communities by taking a leadership role in community development, hence SHG are perceived to be a guiding force for village. The loans that SHG members received are intended to improve their livelihood so that they can receive greater and steadier cash flows.

The concept of Self-help groups had its origin in the co-operative philosophy and the co-operators by and large, including the National Federations in the credit sector, could not think of any better SHG than a primary co-operative credit society itself, as SHG are small and economically homogenous affinity groups of rural poor, they are voluntarily coming together for achieving the: (1) To save small amount of money regularly (2) To mutually agree to contribute a common fund (3) To meet their emergency needs (4) To have collective decision making (5) To solve conflicts through collective leadership mutual discussion and (6) To provide collateral free loan with terms decided by the group at the market driven rates.

The SHG is a group of rural poor who have volunteered to organize themselves into a group for eradication of poverty of the members. The basic principles of the SHGs are group approach, mutual trust, organization of small and manageable groups, group cohesiveness, spirit of thrift, demand-based lending, collateral free, Women friendly loan, peer group pressure in repayment, skill training capacity building

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 118-121
Received: 02-01-2019
Accepted: 04-02-2019

Rajesh Kumar
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vishuddha Nand
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Verma
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Doharey
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Anjali Kumari
D.A.V. Collage, Kanpur, Uttar Pradesh, India

Raju
S.V.P. University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Correspondence
Rajesh Kumar
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of herbicides on weed control efficiency (%), yield attributes, yield and profitability of wheat (*Triticum aestivum* L.)

Rajesh Kumar, Vishuddha Nand, SK Verma, RK Doharey, Anjali Kumari and Raju

Abstract
A field experiment entitled "Evaluation of herbicide for control of complex weed flora in wheat (*Triticum aestivum* L.)" was conducted at Crop Research Station, Masodha (U.P.) during *Rabi* season of 2011-12 and 2012-13 with an objective to evaluate the herbicide against grassy and broad leaved weeds. To find out the effect of weed control on weeds, yield of wheat and to find out the economics of various treatment combinations. The soil of the experimental field was silt loam, having pH 7.6, organic carbon 0.42, available N, P and K 145, 17.5 and 224 kg ha^{-1}, respectively. Field trial was laid out in RBD with three replication, having fourteen treatments viz. Metribuzin 210 g ha^{-1}, Clodinafop 60 g ha^{-1}, Pinoxaden 40 g ha^{-1}, Sulfosulfuron 25 g ha^{-1}, Clodinafop + Metribuzin 60 + 210 g ha^{-1}, Pinoxaden + Metribuzin 40 + 210 g ha^{-1}, Sulfosulfuron + Metribuzin 25 + 210 g ha^{-1}, Accord Plus (Fenoxaprop+Metribuzin) (120+210 gha^{-1}) 1500 ml ha^{-1},Total (Sulfosulfuron + Metsulfuron) (32 g ha^{-1},) 40 g ha^{-1}, Atlantis (Mesosulfuron + Iodosulfuron) (14.4 g ha^{-1}) 400 g ha^{-1}, Vesta (Clodinafop + Metsulfuron) (60+4 g ha^{-1}) 400 g ha^{-1} and Isoproturon + 2,4-D 1000+500 g ha^{-1}, weed free and weedy check. The herbicides treatment were executed at 35 DAS with the help of manually operated knapsack sprayer fitted with flat fan nozzle. The minimum weed dry weight and maximum WCE(88.76%) were recorded with with Vesta (Clodinafop + Metsulfuron) (60+4 g ha^{-1}) 400 g ha^{-1} which was at par with Tota l(Sulfosulfuron + Metsulfuron) (32 g ha^{-1},) 40 g ha^{-1}, and significantly better for effective weed control as compared to rest of the herbicidal treatment. All the yield contributing characters viz., no. of spike m^{-2}, no. of grain $spike^{-1}$, 1000-grain weight as well as grain yields were significantly higher in weed free over rest of the treatments. Among herbicides maximum no. of spike m^{-2} (437.85) no. of grain (40.12)$spike^{-1}$, 1000-grain weight (37.33g) as well as grain yields (52.81q/ha.) were recorded with Vesta (Clodinafop + Metsulfuron) (60+4 g ha^{-1}) 400 g ha^{-1} With respect to economics, Vesta (Clodinafop + Metsulfuron) (60+4 g ha^{-1}) 400 g ha^{-1} recorded maximum net return (Rs. 59895) and B-C ratio (Rs. 2.43).

Keywords: wheat, herbicides, weed dry weight, yield attributes, yield

Introduction
Wheat is an important prime cereal crop among the food-grain is grown in an area of 29.65 m ha in India, with the production 93.5 million tonnes and average productivity 31.53 q ha^{-1} (FAO, 2013). There are a number of factors responsible for lower productivity of wheat crop as compared to certain developed countries. Biotic as well as the abiotic factors are also posing serious threats in realizing the full potential. Among the abiotic factors, the global warming consequently increase in the temperature at milking stage of the crop is the major threat affecting the productivity adversely. Wheat crop is infested with a number of weeds namely *Phalaris minor, Cyperus rotundus, Cynodon dactylon, Chenopodium album, Anagallis arvensis, Avena fatua, Convolvulus arvensis* etc which can cause upto 33% reduction in wheat yield. *Phalaris minor* is one of the very serious problems in wheat. Significant reduction in wheat yield due to severe infestation of weeds ranging from 18-73% has been reported by Pandey and Verma (2004) [8]. However, some broad leaf weeds are also causing a threat but their control is comparatively easier and effective as compared to that of *Phalaris minor*, really serious challenge. The wild oat reduce grain yield of winter wheat by 17-62% depending upon cultivars.

There are several options like manual weeding and herbicidal application, available for the efficient management of weeds applied before sowing and successive crop growth stages. 2, 4-D is a stage specific herbicide and even tolerant cereal crops are very sensitive to 2, 4-D when applied at germination and seedling stages resulting in malformation of the spikes (Gill & Walia, 1987). Wheat found most sensitive to 2, 4-D applied at the 3 leaf to early tillering stags and most tolerant at the 4th to 5th leaf stages (Voevodim *et al.*, 1975)[11].

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

KNOWLEDGE LEVEL OF OKRA GROWERS WITH RESPECT TO SCIENTIFIC PRODUCTION TECHNOLOGY IN KANNAUJ DISTRICT (U.P.)

R.K. Doharey[1], Kamal Kishore[2], Prakash Singh[3], Shalu Gutam[4],
[1,2,3&4]Department of Extension Education, College of Agriculture, NDUA&T., Kumarganj, Ayodhya(U.P.)- 224229

Abstract

The study was conducted in Chhibramau and Talgram blocks of Kannauj district (UP) selected purposively, because these blocks one more popular for area and production of okra. A total number of okra growers were selected through random sampling from eight selected village's panchayats on the basis of ten respondents from each selected village panchayats. The some structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The results of the study depicted that the majority of the respondents were found in knowledge level field preparation (96%) were rank at 1st as far as knowledge possessed by the respondents were concerned. The insect/pest rank at 2nd rank (94%), followed by seed rate at rank 3rd (93.%), method of sowing of okra at 4th rank (92%),intercropping and weed management time of 5th (91.05%), suitable variety at rank 6th (90%), crop rotation at rank 7th (87%), irrigation management at rank 8th (86%), manure and fertilizer 9th (77%), disease control at rank 10th (73.75%), seed treatment rank 11th (61%), distance at rank 12th (58%), time of treatment 13th (51%), harvest and postharvest at rank 14th (37.05%) respectively. The overall knowledge index was calculated to be 77.62%. It can be calculated that the extent of knowledge about scientific okra cultivation seems to be satisfactory.

Key words : Knowledge level of okra growers with respect to scientific production technology.

Introduction

Indian subcontinent is endowed with favorable climate which permits growing of vegetables throughout the year. Vegetables play an important role in balanced nutrition as they are valuable source of carbohydrates, proteins, vitamins and minerals. The Per capita consumption of the vegetables in India is 160 g per day per person as against recommendation of 300 g per day per person. According to these statistics, we need to produce approximately 0.3 MT of vegetables per day for the present population. The present earning through vegetables export is little bit exceeding to Rs. 300 crores. Nature has endowed our country with vast diversity of land, soil and agro-climatic conditions which enables to produce varied types of vegetable crops. The area and production of vegetables are increasing year after year after the green revolution. There is substantial increase in production and productivityof vegetable crops. Due to growing of improved hybrid varieties and adoption of improved cultivation technologies, India"s share in the world production of vegetables is about 7 per cent (Anonymous, 1999).

Okra or ladies finger is an important vegetable of the tropical countries and most popular in India, Nigeria, Sudan, Iraq, Pakistan, etc. Okra is found in it's wild state on the alluvial banks of the Nile and the Egyptians were the first to cultivate it in the basin of the Nile (12'th century BC). It was propagated then through North Africa to the Mediterranean, the Balkans, and India. It arrived then in the America at Brazil (1658), Dutch Guinea and at New Orleans before extending in the United States and going up to Philadelphia in 1781. Its scientific name is "Abelmoschus esculents" and also "Hibiscus esculents", it belongs to the family Malvaceae. It is a tropical plant, 15 which grows best in warmer climates. It"s ready to harvest in around 60 days when the blooms begin to open, and is slightly tough. They have to be picked about 4-5 days after flowering in the fall. Okra varies in shades of green and can be smooth or has ribbed surfaces. (Varmudy, 2010).

Area and production of okra in India is 452,000 ha. and 4,803,000 MT. in Nigeria 387,000 ha. and 1,039,000 MT. and in Sudan 21,926 ha. and 223,650 MT. Here the share of India is 67.1 per cent, followed by Nigeria at 15.4 per cent and Sudan at 9.3 per cent. (FAO, 2010). In India, okra is grown throughout except in the mountain regions. The major producers are West Bengal, Bihar, Orissa, Andhra Pradesh and Gujarat. As far as area under okra cultivation in India is concerned, Orissa has an area of 74 thousand ha, West Bengal has an area of 73.1 thousand ha under okra cultivation followed by Gujarat, Andhra Pradesh, Jharkhand and others states. In terms of okra production, it is 0.83 million tones in West Bengal, 0.65 million tones in Orissa and 0.43 million tonnes in Andhra Pradesh. The average productivity in India is 10.5 tones per hectare. The highest productivity is in Andhra Pradesh at 15 tones per hectare followed by Jharkhand at 14 tons per hectare. The total area under this crop has increased over the years.

We eat food for good growth of our body. The food we eat contains nourishing substances called nutrients. There are five major nutrients, namely carbohydrates, proteins, fats, minerals and vitamins. It has an average nutritive value of 3.21 gm, which is higher than tomato, pumpkin and ashgourd. It contains 27 gm of carbohydrates, 2.2 gm of proteins, 0.29 gm of fat, 90 mg of calcium, 50 mg of phosphorus, 15 mg of iron and 6 mg of vitamin C per 100 gm of edible portion. The seeds contain 18-20 per cent oil and 20-23 per cent crude protein. Soups and stews of okra are popular dishes in India. The seeds, when ripe are sometimes roasted and used as a substitute for coffee. The roots and stems of okra are used for clarification of sugarcane juice before it is converted into jiggery and brown sugar. The crop is used in the paper industry and fiber is extracted from its stem. Okra is considered by many as a super-vegetable with a lot of nutrition and medicinal benefits. Fibre also helps in stabilizing blood sugar. The mucilage not only binds cholesterol but also the bile acid carrying toxins dumped into it by the liver. Its fiber absorbs water and helps to prevent constipation. In fact, its slippery characteristics, which people dislike, facilitates elimination of excess cholesterol and toxins from the body.

There is many medicinal importance of okra; (i) The tender fruit is boiled and administered in fevers, gastric ulcers, catarrh, inflammation of the mucous membrane, difficulty in urination and dysentery. (ii) It is also considered remedy for spermatorrhea (involuntary discharge of the semen), syphilis, gonorrhea, and other disorders of the genitals. (iii) The fruit is also reported to increase sexual potency. (iv) The unripe fruit is eaten for tuberculosis of the lungs. (v) The infusion of the seeds will induce perspiration etc.

Okra can be grown in a wide range of soils – sandy loams to clay loams, provided they are well drained and supplied with enough organic matter. Main Okra growing season is Kharif (rainy season) June-July. However, it can be grown in September-October, January-February and also in summer season, where assured irrigation facilities are available (www.indiaagronet.com). Out of 137.00 lakh hectares geographical area of Chhattisgarh, 43 per cent area comes under cultivation. On the basis of climate and topography the state is divided into three agro climatic zones i.e. Chhattisgarh plains, Northern hills and Bastar Plateau. Horticulture exports has helps the country to earn 14,000 crore tones in the year of 2011-2012. Indian horticulture has crossed of production all time of over 240 million tones in the year of 2011-2012.

Keeping this in view, the present research entitled "To study the knowledge level of okra growers with scientific production technology"

Materials and Methods

The study was conducted in purposively selected Kannauj district of Uttar Pradesh. There are 8 community development blocks in this

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 989-997

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 989-997
Journal homepage: http://www.ijcmas.com

Review Article

Maize (*Zea mays* L.) Crop at Various Stages of Growth in Rabi Season as Influenced by Varieties, Plant Geometry and Nutrient Management

Vishuddha Nand*, Rajesh Kumar, R. K. Doharey and S. K. Vema

Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad 224 229 (U.P), India
**Corresponding author*

A B S T R A C T

Maize is one of the most important cereal crops in the world agricultural economy both as food for man and feed for animals including poultry. It is also known as "queen of cereals'' because of very high yield potential, it is giving low yields because of lack of appropriate information about plant geometry and fertilizer management. Nitrogen, phosphorus and potassium are the major plant nutrients, which limit normal plant growth. Increasing productivity per unit area through agronomic management is one of the important strategies to increase the production of maize grain. Keeping this in view, various experiments were have been carried out on the effect of plant geometry and different dose of various inorganic fertilizers have seen very widely on hybrid and composite variety of maize in winter season. The information available on growth parameters *viz*, plant height, no of leaves/plant, LAI, dry weight/plant, CGR, RGR and NAR at various stages of crop growth as affected by varieties of maize and plant geometry and in conjunction with nitrogen, phosphorus, potash and zinc is also reviewed.

Keywords

Maize, hybrid, composite, plant geometry, growth, NPK and Zn and yield

Introduction

Maize (*Zea mays* L.) is one of the most versatile emerging crops having wider adaptability under varied agro-climatic conditions. Globally, maize is known as queen of cereals because it has the highest genetic yield potential among the cereals. It is cultivated on nearly 150 m ha in about 160 countries having wider diversity of soil, climate, biodiversity and management practices that contributes 36 % (782 m t) in the global grain production. The United States of America (USA) is the largest producer of maize contributes nearly 35 % of the total production in the world and maize is the driver of the US economy. The USA has the highest productivity (> 9.6 t ha-1) which is double than the global average (4.92 t ha-1). Whereas, the average productivity in India is 2.43 t ha^{-1}.

It is also one of the most important cereal crops in the world agricultural economy both as food for man and feed for animals including poultry. Green cobs are roasted and consumed by people with great interest. The grains of special variety called the 'popcorn', are characterized by a hard corneous interior structure are converted into the 'popped' form, which is the favourite food for children in urban areas. Several food dishes including *chapaties*are prepared out of maize flours and grains. It is

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(2): 126-130
Received: 06-01-2019
Accepted: 07-02-2019

Vishuddha Nand
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

R Yadav
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

RK Doharey
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

SK Verma
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

Neeraj Yadav
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

RK Yadav
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

Correspondence
Vishuddha Nand
ND University of Agriculture and Technology, Kugmargaj, Ayodhya, Uttar Pradesh, India

Effect of fertilizers and cutting schedule on growth and quality of dual purpose barley crop (*Hordeum vulgare* L.)

Vishuddha Nand, R Yadav, Rajesh Kumar, RK Doharey, SK Verma, Neeraj Yadav and RK Yadav

Abstract
A field experiment was carried out at Agronomy Research Farm,Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.) during Rabi season 2016-17.The experiment was laid out in Split Plot Design with three replications. Main plot were treated with fertilizer levels, F_1 (60 kg N+ 30kg P_2O_5 ha^{-1}), F_2(80 kg N+40 kg P_2O_5 ha^{-1}), F_3 (100 kg N+50 kg P_2O_5 ha^{-1}) and F_4 (120 kg N+60 kg P_2O_5 ha^{-1}) and sub plot were treated with cutting schedule as 45 DAS, 55 DAS, 65 DAS and 75 DAS. The results revealed that the growth parameters like, plant height, dry weight of plant, leaf area index (LAI) and no. of tillers at first cutting and at harvest were recorded maximum with the application of 120 kg N + 60 kg P_2O_5 ha^{-1} followed by 100 kg N + 50 kg P_2O_5 kg ha^{-1} and 80 kg N + 40 kg P_2O_5 ha^{-1} respectively and significantly higher over the application of 60 kg N +30 kg P_2O_5 ha^{-1}. The maximum plant height (77.28 cm) was recorded when barley crop cut as 75 DAS which was higher tune to the 12.6%, 17.57% and 32.51% over 65, 55 and 45 days after sowing. The dry matter accumulation, leaf area index and no. of tillers were also maximum in the same cutting. However, the quality parameters *viz*, crude protein (12.88%), crude fiber (31.87%),TDN (65.93%), WSC(10.40%), ADF (31.34%), NDF (52.49%) and Ash (13.34%) were recorded maximum with the application of 120 kg N + 60 kg P_2O_5 ha^{-1} while in case of cutting schedule the maximum crude fiber (31.49%), WSC (10.80%), ADF (33.58%), NDF (54.02%) and Ash (15.20%) were found at first cut (75 DAS) where as crude protein (13.13%) and TDN (65%) obtained at first cut (45 DAS).

Keywords: growth, LAI, fresh weight, plant height, P_2O_5, Barley and cutting schedule

Introduction
India is the largest milk producing country in the world with livestock population of 529 million and milk production 133 mt. It contributes nearly 7% in the global cereal production. Barley grain largest use as animal feed in all over the world and in India also, a major share of barley grain is used as animal feed either alone or mixture with fodder crops. Barley has tremendous potential and variation for production of very high amount of digestible dry matter as well as protein yield per hectare. It is grown successfully in a wider range of climatic conditions than any other cereals. Barley has such morpho-physiological traits that make it suitable for dual purpose cultivation for fodder and grain production than other cereals. It is highly efficient in the utilization of water and nutrients in limiting conditions. It is high capacity of crop for tillering and regenerate after cutting and additional capacity for large accumulation of biomass. It sets seed rapidly after re-growth, thus escaping terminal stress due to high temperature and warm winds often experienced in the region. Thus, as a dual purpose (green forage and feed/grain) crop it provides a welcome boost to the confidence of forage growers and fits well for crop diversification in the integrated crop+livestock farming system. Area under barley in world is 47.5 mha with 123.7 mt production and 2.68 t/ha Productivity. Russian federation holds first position in all over the world in terms of area and production with 4.94 mha and 8.35 mt respectively.

In India, barley crop was grown over an area of 695.0 thousand hectare with a production of 1743.2 thousand tones and productivity of 2.51 t ha^{-1} during 2012-13 (Anonymous, 2013) [1]. Uttar Pradesh is one of the most important barley growing states of India. In Uttar Pradesh, the area under cultivation of barley is about 168.0 thousand ha^{-1} with a production of 441.0 thousand tonnes and productivity of 2.63 t ha^{-1} (Anonymous, 2013) [1]. Dual purpose barley is an excellent alternate crop for fodder purpose. The nutritive value of green fodder is highest at 50% flowering stage and decreases after flowering stage in most of the crops. In dual purpose barley crop, stage of harvesting also determine the regenerative potential of the crop, the regeneration capacity is adversely affected by the higher stage of harvesting for green fodder.

Plant Archives Vol. 18, Special Issue (ICAAAS-2018), 2018 pp. 105-109 *ISSN 0972-5210*

COMMUNICATION BEHAVIOR OF MILK PRODUCERS OF ESTERN AND WESTERN U.P., INDIA

Manoj Kumar[1*], R. K. Doharey[1], Subodh Kumar[2], Prakash Singh[1], S. N. Singh[3] and Kaushik Prasad[1]

[1]Department of Extension Education, College of Agriculture, N.D.U.A. & T., Kumarganj, Faizabad-224 229 (U.P.), India.
[2]Department of Veterinary Extension, Collage of Veterinary Science, N.D.U.A. & T., Kumarganj, Faizabad - 224 229 (U.P.), India.
[3]SMS, KVK Mashodha (Agriculture Extension), Faizabad (Uttar Pradesh), India.

Abstract

The study was under taken in two parts of Uttar Pradesh state *i.e.* Eastern and Western. From Eastern part the district Faizabad and Western part the district Bulandshahar were selected purposively. A total number of 100 dairy farmers (50 from Faizabad and 50 from Bulandshahar) were selected through proportionate random sampling from four sampled villages on the basis of herd size. The interview schedule was developed keeping in view the objectives & variables under study. Finding that both the farmers i.e. Eastern district Faizabad and Western district bulandshahar had cell phone (98.33% & 98.33%), followed by mobile (94% & 96%), T.V. (74% & 88%), respectively. It may be, therefore, concluded that the position of communication media possession of Faizabad dairy farmers was found to be better as compared to bulandshahar dairy farmers. No social participation reported by Faizabad dairy farmers (32%) and the bulandshahar dairy farmers (12%).

Key words : Farmer, milk production practices, farmers, animals, milk producer, information sources.

Introduction

The Government of India has launched several rural development programme time to time since independence. One such progarmme was launched during seventies was the Integrated Rural Development Programme (IRDP). IRDP as a centrally sponsored scheme aims to provide financial assistance to poorer sections of society in form of subsidies and loans to economically beneficial activities, which could generate sufficient income for enable them to cross the poverty line.

In spite of India's position as highest producer of milk, productivity per animal is very poor. It is only about 987 kg/lactation as against world average of 2,038 kg/ lactation. The low productivity is due to the gradual genetic deterioration and neglecting of animals rearing over the centuries consequently due to the rise in the population of non-descriptive cows (80%) and buffaloes (50%). Other factors contributing to low productivity include continuing draughts in some parts of the country, chronic shortages of feed & fodder coupled with their poor nutritive value and poor fertility of dairy animals. Hence, we have to face a twin challenge :

Increase milk productivity of animals with the limited resources on one hand and make best use of the available milk by processing it into hygienic packaged milk and milk products of high quality on other hard. The average milk production of indigenous cattle in the country is hardly 500 kg/lactation. This is partly due to poor feeding. These animals, if properly fed, will definitely produce better milk production. Even the programme of producing large number of cross-breed in cows with quality of high yield potential must also be supported by balanced and economic feeding practices for optimum milk production.

Cattle is believed to be the first step of the primitive man toward civilization. Livestock has played a crucial role in the development and progress of mankind. They have provided human beings with food, energy, clothing and nutrition besides helping in transport and agricultural activities. They have also been mute companions to humans. Today, cattle rearing has become a subsidiary vocation for many house hold generating additional

Author for correspondence : E-mail-singhmanojlodhi@gmail.com

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(2): 2492-2497
© 2018 IJCS
Received: 15-01-2018
Accepted: 16-02-2018

Anil Kumar
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vishuddha Nand
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rajesh Kumar
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Doharey
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

MP Singh
Department of Agronomy, Janta College, Bakerwar, Etawah, Uttar Pradesh, India

SK Verma
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Anil Kumar
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of leaf colour chart based nitrogen management on growth and uptake of rice (*Oryza sativa* L.) cultivar in eastern Uttar Pradesh

Anil Kumar, Vishuddha Nand, Rajesh Kumar, RK Doharey, MP Singh and SK Verma

Abstract
N urea +LCC<3, 25%N FYM +LCC<4, 25%N urea +LCC<4, 25%N FYM +LCC<5, 25%N urea +LCC<5, along with the recommended dose of NPK (150:60:40 kg/ha) were taken for study. The growth parameters likes, plant height (123.66, 121.14cm), number of shoots (528.25, 523.67), dry matter (842.81, 831.67 g), and Leaf area index (7.14, 6.62) were maximum recorded in PA-6444 which was significantly higher over PHB-71 and NDR-359, respectively. While, PA-6444 recorded highest nitrogen, phosphorus and potassium uptake by grain, straw and total which was significantly higher over the both variety PHB-71 and NDR-359.Among nitrogen levels, 25% N urea +LCC<5 was recorded highest nitrogen, phosphorus and potassium uptake by grain, straw and total. The maximum grain yield was obtained with rice cultivar PA-6444 (65.92-64.51 q/ha) which was superior over NDR-359 (59.01-55.99 q/ha) and at with par PHB-71 (63.85-63.30 q/ha). Among the LCC nitrogen based management. The highest biological yield was recorded under 25% N basal as Urea + LCC<5 which was significantly superior over rest of treatments.

Keywords: NPK, LCC, rice, plant height, dry matter, LAI, nutrient uptake and contain

Introduction
Rice is the bulk of food security of the global population. In 21st century there will be the need of about 250 million tons of food grains to feed the rapidly increasing population. To meet this challenge, intensive cropping pattern were adopted which resulted in decline nutrient status of soil. There is an indication of stagnation on even declining in the production of rice crop; this may be due to decline organic matter, over mining of nutrients reserve, indiscriminate and imbalanced use of chemical fertilizers and continuous mono cropping. Since, fertilizer N losses are estimated to range from 10-65% of the applied N (Cassman *et al.* 1998; Singh & Singh, 2003) [13, 1]. Hence, its management strategies must be responsive to temporal variations in crop N demands and soil N supply in order to achieve supply-demand synchrony for minimizing N losses. When N application is not synchronized with crop N demand, N losses from the soil–plant system are large, leading to low N fertilizer use efficiency. In many field situations, more than 60% of applied N is lost because of the lack of synchrony of plant demand with N supply (Singh and Singh, 2003) [1]. Peng *et al.* (1998) [13] demonstrated that RE (Recovery efficiency) of top dressed urea during panicle initiation stage could be as high as 78%. Hence, plant need-based application of N is important for achieving high yield and high N use efficiency. Improving the synchrony between crop N demand and the N supply from soil and/or the applied N fertilizer is likely to be the most promising strategy to increase nitrogen use efficiency in rice. Current fertilizer recommendations for rice in most rice growing countries of Asia typically consist of fixed rate and timing on a regional scale. Most of the farmers generally apply fertilizer N in several split applications, but the number of splits, amount of N applied per split, and the time of applications vary substantially.
The apparent flexibility of rice farmers in adjusting the time and amount of fertilizer application offers potential to synchronize N application with the real-time demand of the rice crop. Due to enormous farm to- farm variability in soil N supply, blanket recommendations for fertilizer N application for a large region generally lead to low NUE. To avoid the risk of N deficiency, many time farmers apply fertilizer N in excess, which also leads to low N recovery by rice. Real-time N management strategies aim at meeting fertilizer N supply with actual crop

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 2582-2589

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 2582-2589
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Seed Rate and Herbicides on Yield Attributes and Yield of Late Sown Wheat (*Triticum aestivum* L.)

Rajesh Kumar[1*], Vishuddha Nand[1], R.K. Doharey[1], Sanjay Kumar Verma[1] and Anjali Kumari[2]

[1]Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229 (U.P.), India
[2]D.A.V. College, Kanpur (U.P.), India
**Corresponding author*

Keywords

Seed rate, Herbicides, Hand weeding, Wheat, Yield attributes and yield

ABSTRACT

An experiment was conducted at Crop Research Center of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh during Rabi seasons of 2012-13 and 2013-14 to assess the effect of seed rate and weed management practices on yield attribute and yield of late sown wheat (*Triticum aestivum* L.). The treatment consisted of three seed rate 100,125 and 150 kg ha^{-1} in main plot and six weed management practices *viz*. Sulfosulfuron 25 g ha^{-1}, Sulfosulfuron + Metsulfuron (30 + 2 g ha^{-1}), Clodinafop + Metsulfuron (60 + 4 g ha^{-1}), Fenoxaprop-p-ethyl + Metribuzin (120 + 210 g ha^{-1}), two hand weeding (120 and 40 DAS) and weedy check in sub-plots. The experiment was laid out in split plot design with three replications. Maximum number of spike m^{-2} was recorded at 150 kg ha^{-1} seed rate was significantly higher than 100 and 125 kg ha^{-1} seed rate. Other yield contributing characters like spike length, number of spikelets spike^{-1}, number of grain spike^{-1} and weight of 1000 grains were not influenced considerably, 100 kg ha^{-1} seed rate registered higher value of above yield contributing characters than 125 and 150 kg ha^{-1} seed rate. All weed management practices produced significantly higher no. of spike per unit area, no. of spikelets spike^{-1} and no. of grain spike^{-1} over weedy check while test weight and length of spike was found non-significant but numerically higher with weed management practices over weedy check. Two hand weeding produce maximum no. of spike m^{-2}, no. of spikelets spike^{-1} and no. of grain spike^{-1} which was at par with clodinofop + metsulfuron (60 + 4 g ha^{-1}) and sulfosulfuron + metsulfuron (30 + 2 g ha^{-1}. A seed rate of 150 kg ha^{-1} produced significantly higher grain, straw and biological yield than its lower level of 100 and 125 kg ha^{-1} seed rates. All weed management practices exception of fenoxaprop-p-ethyl + metribuzin (120 + 210 g ha^{-1}) had significant effect on grain, straw and biological yield, two hand weeding produce maximum grain, straw and biological yield which was at par with clodinofop + metsulfuron (60 + 4 g ha^{-1}) and sulfosulfuron + metsulfuron (30 + 2 g ha^{-1}). Fenoxaprop-p-ethyl + Metribuzin (120 + 210 g ha^{-1}) had Phytotoxic effect on wheat plants and produce minimum yield which was at par with weedy check.

Introduction

Wheat is an important prime cereal crop among the food-grain is grown in an area of 29.65 m ha in India, with the production 93.5 million tonnes and average productivity 31.53 q ha^{-1} (FAO, 2013). Among several causes of low productivity in Uttar Pradesh,

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(2): 2498-2502
© 2018 IJCS
Received: 17-01-2018
Accepted: 20-02-2018

Rajesh Kumar
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vishuddha Nand
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Doharey
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sanjay Kumar Verma
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Raju
S.V.P. University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Correspondence
Rajesh Kumar
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of seed rate and weed management practices on growth parameters and dry matter accumulation of late sown wheat (*Triticum aestivum* L.)

Rajesh Kumar, Vishuddha Nand, RK Doharey, Sanjay Kumar Verma and Raju

Abstract
An experiment was conducted at Crop Research Center of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh during Rabi seasons of 2012-13 and 2013-14 to assess the effect of seed rate and weed management practices on growth parameters and dry matter accumulation of late sown wheat (*Triticum aestivum* L.). The treatment consisted of three seed rate 100,125 and 150kg ha^{-1} in main plot and six weed management practices viz. Sulfosulfuron 25 g ha^{-1}, Sulfosulfuron + Metsulfuron (30 + 2 g ha^{-1}), Clodinafop + Metsulfuron (60 + 4 g ha^{-1}), Fenoxaprop-p-ethyl + Metribuzin (120 + 210 g ha^{-1}), two hand weeding (120 and 40 DAS) and weedy check in sub-plots. The experiment was laid out in split plot design with three replications. Sowing with 150 kg ha^{-1} seed rate recorded maximum germination count at 15 DAS, number of tillers/m^1 row length, Plant height, leaf area index (LAI), and dry matter accumulation which were significantly higher than 100 and 125 kg ha^{-1} seed rate. Germination count of wheat at 15 DAS was almost similar under all the weed management practices. At 30 DAS two hand weeding produce significantly higher number of tillers m^{-1} row length and plant height than rest of the weed management practices, while LAI and dry matter accumulation was non-significant. At 60, 90 DAS and at harvest number of tillers, Plant height, LAI and dry matter accumulation recorded maximum with two hand weeding which was at par with Clodinafop + Metsulfuron (60 + 4 g ha^{-1}), Sulfosulfuron + Metsulfuron (30 + 2 g ha^{-1}), Sulfosulfuron 25 g ha^{-1} and significantly higher than Fenoxaprop-p-ethyl + Metribuzin (120 + 210 g ha^{-1}) and weedy check. Fenoxaprop-p-ethyl + Metribuzin (120 + 210 g ha^{-1}) had Phytotoxic effect on wheat plants was produce minimum number of tillers, plant height, leaf area index and dry matter accumulation at all the stages of observation taken which was at par with weedy check.

Keywords: seed rate, herbicide, LAI, growth character's and Dry weight

Introduction
Wheat is an important prime cereal crop among the food-grain is grown in an area of 29.65 m ha in India, with the production 93.5 million tonnes and average productivity 31.53 q ha^{-1} (FAO, 2013) [4]. Among several causes of low productivity in Uttar Pradesh, adoption of rice-wheat rotation is one. Late transplanting of rice or use of long duration varieties in low land fields delays the sowing of wheat. The preceding crop like sugarcane, potato, paddy and toria etc. vacate the field late in season after normal sowing date of wheat and other factors enforce the crop be sown as much late as in the end of December and beginning of January. Late sown crop experiences high temperature, declining relative humidity and hot dissecting winds in later stage of crop growth, particularly during grain filling stage. Yield potential and productivity of wheat under late sown condition is poor due to less exploitation of potentialities of the crop. Emergence of seedling due to low temperature curtailing the periods from emergence to maturity in late sown condition optimum plant population can be maintain by optimum seed rate (Singh and Singh, 1987) [17]. Late sowing of wheat tends to reduce germination count due to low temperature at germination and tillers $unit^{-1}$ area because of rise in temperature during tillering phase of the crop and consequently increase in the temperature at milking stage of the crop is the major threat affecting the productivity adversely. To mitigate the deleterious effect of delayed sowing, increasing seed rate will be a viable and economic option to compensate the reduction germination count and number of tillers per unit area. Seed

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; 6(2): 2539-2544
© 2018 IJCS
Received: 04-01-2018
Accepted: 07-02-2018

Vishuddha Nand
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Rajesh Kumar
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

RK Doharey
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

MP Singh
Department of Agronomy, Janta College, Bakerwar, Etwah, Uttar Pradesh, India

SK Verma
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Narendra Dev University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Study about the interaction effects on varieties and plant geometry on growth and yield of hybrid and composite maize (*Zea mays* L.) on *rabi* season

Vishuddha Nand, Rajesh Kumar, RK Doharey, MP Singh and SK Verma

Abstract
An experiment was conducted at Agronomy research Farm of C.S.A University of Agriculture and Technology, Kanpur (U. P), during winter season in 2010-11 and 2011-12. The experiment was laid out in split plot design with three replications. The main plots were occupied by maize hybrid (cv DHM-117) and composite (cv Madhuri) along with three plant geometry, 45cm x 20 cm (1,11,111 plants/ha), 60cm x 20 cm (83,3,33 plants/ha) and 60cm x 25 cm (66,6,66 plants/ha) and sub plot was allotted by three fertility levels *viz*, F_1- N, 120 kg, P_2O_5, 60 kg, K_2O, 40 kg and $ZnSo_4$, 15 $kgha^{-1}$, F_2 - N, 150 kg, P_2O_5, 80 kg, K_2O, 60 kg and $ZnSo_4$, 20 $kgha^{-1}$ and F_3 - N, 180 kg, P_2O_5, 100 kg, K_2O, 80 kg and $ZnSo_4$, 25 $kgha^{-1}$. The experiment results revealed that all the growth and yield parameters like plant height (cm), number of leaves/plant, dry weight (g/m^2) and leaf area index (LAI), maize grain and stover yield (t/ha) and harvest index % (HI%) at harvest stage were found significant interaction between varieties and plant geometry. The maize hybrid was found better than Composite in among parameters. Plant geometry 60cm x 20cm was obtained significantly maximum yield (6.7 t/ha) compared to plant geometry 45cm x 20cm (6.20 t/ha), 60cm x 25cm (6.15 t/ha), respectively. In various fertility levels F_3 was found superior followed by F_2 and F_3 treatments, respectively. While the harvest index (%) and Shelling (%) were did't found significant in among the treatments.

Keywords: Maize, plant geometry, interaction, NPK and Zn, LAI, HI%, yield

Introduction
Maize (*Zea mays* L.) is one of the important cereal crops next to wheat and rice in the world. In India, it ranks third after rice and wheat. Maize is being consumed both as food and fodder and also required by the various industries. In the world, it is grown over an area of 131 mha with an annual production of 506 mt with productivity of 3890 kg ha^{-1} (Anonymous, 2013-14) [2]. In India, it is cultivated over an area of 9.3 mha with an annual production of 24.2 mt and productivity of 2602 kg /ha during *rabi* season (Anonymous, 2013-14) [2]. In Uttar Pradesh, the area, production and productivity of maize were 0.70 m ha, 2.30 mt, 3131 kg/ha, respectively (Anonymous, 2012-13). In India, about 35 per cent of the maize produced, which 60 per cent is used for human consumption, 25 per cent each in poultry feed and cattle feed and 15 per cent in food processing like corn flakes, popcorn *etc.* and in other industries mainly starch, dextrose, corn syrup and corn oil *etc.* Maize yield is closely related to plant population. More plants mean higher yield. However, there is limitation to increasing plant population under humid, tropical conditions. Maize becomes more susceptible to pests and diseases when temperature, rainfall, and humidity are high. The number of plants per unit area is influenced by the distance between row and distance between plants in row. Select an optimum plant spacing that allows for ease of the field operations, such a fertilizer application and weeding, minimizes competition among plants for light, water and nutrients and creates a favorable micro-climate for the canopy that reduced the risk for pests and diseases. Narrow row width of about 50 to 70 cm is recommended to ensure that sunlight falls on the plants and not on bare soil. This reduced weed competition and loss of soil moisture from evaporation. Maize is one of the most important cereal crops grown in tropical and temperate region of the world. Despite its high yield potential, it is giving low yields because of lack of appropriate information on varieties, plant geometry and fertilizer management. Nitrogen, phosphorus and potassium are the major plant nutrients, which limit normal plant growth increasing productivity per unit area through inorganic management is one of the important strategies to increasing the production of maize grain.

Indian Journal of Extension Education
Vol. 55, No. 4, 2019 (87-91)

Extent of Knowledge and Adoption of Potato Growers in Kannauj District of Uttar Pradesh

Ashwani Kumar Verma[1], R.K.Doharey[2], S. K. Dubey[3], Satyapriya[4], Sitaram Bishnoi[5], Om Prakash[6] and Kaushik Prashad[7]

ABSTRACT

Potato is the most important stable and widely distributed food crop in the world with a capacity to slake off hunger among farmers. However, the productivity has stagnated and remained low due to the adoption of poor cultivation practices by farmers. To stave off this situation, better technologies and practices should be prioritized which already exists. In Uttar Pradesh, Kannauj district is anabundant producer of the potato crop. To assess the adoption level and knowledge gap of scientific potato cultivation practices the study was conducted in Jalalabad block of Kannauj district of Uttar Pradesh. A simple random sampling method was used to select 125 respondents out of total 1338 potato growers from the selected five villages. The finding revealed that the majority of the respondents have 100 per cent knowledge in mixed cropping, sequence cropping, and field preparation. There is a huge variation among the cultivation practices in respect of their adoption, the highest being 82.40 per cent for sequence cropping and the lowest 50.40 per cent for seed rate and seed treatment with the overall adoption of 68.30 per cent. Out of 16 independent variables four variable age, marital status, family type, and occupation were not significant but positively correlated with knowledge level. Only one variable education was found highly significant and positively correlated with adoption level.

Key words: Extent of adoption, level of knowledge, potato growers, scientific practices.

INTRODUCTION

Potato *(Solanumtuberosum L.)* is one of the major vegetable crops of the world. In India, it is cultivated during winter season in the plains and on hills during summer season. Its productivity is affected by both environmental factors and crop management practices. It also varies considerably between the regions, between areas with the region and with cultivation practices even at high fertility level.

Among the food crops, potato ranks fourth in importance next only to rice, wheat and maize, covering an area of 21.64 million hectares and fifth in production, yielding 46545.6 million tonnes annually after sugarcane, rice and maize (Annual Report 2016-17, GOI.) (Table1).

Table 1: Area (000ha), Production (000mt) and Yield (Mt/ha) of potato in India and U.P.

	India			U.P.		
Year	Area	Production	Yield	Area	Production	Yield
2013-14	1973.0	41555.0	21.1	546.25	13808.76	24.47
2014-15	2075.9	48009.2	23.1	607.32	14879.34	24.50
2015-16	2116.9	43417.0	20.5	607.32	13851.76	22.81
2016-17	2164.1	46545.6	21.5	611.15	13916.00	22.77

Source: Horticultural Statistics at a glance (2017), Ministry of Agriculture and Farmers Welfare, GOI.

During last four years, the area under potato has marginally increased (Table 1). Uttar Pradesh is one of the major potato growing states where area under potato has phenomenally increased during the same Period (Table 1).

[1] Research Scholar, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh, [2] Professor, [3] Research Scholar Department of Extension Education, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India [4] Principal Scientist ICAR-ATARI, Zone III, Kanpur. [5,6&7] Principal Scientists, Division of Agricultural extension, ICAR-IARI, New Delhi

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; SP-8(2): 43-55
© 2020 IJCS
Received: 04-01-2020
Accepted: 06-02-2020

Vinay Kumar
IIPR Kalyanpur, Kanpur, Uttar Pradesh, India

Ramesh Singh
Department of Plant Pathology, CSAUAT, Kanpur, Uttar Pradesh, India

RK Doharey
Professor & Associate Dean, COA, Campus, Azamgarh, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Ramesh Chand
Assistant Professor, Department of Plant Pathology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Sushant Srivastava
Professor, Department of Vet Gynecology, CVSCAH, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rabindra Kumar
Assistant Professor, Department of Vet. Gynecology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Vinay Kumar
IIPR Kalyanpur, Kanpur, Uttar Pradesh, India

Study the effect of integrated disease management approach on germination, plant height and yield of potato and on severity of late blight of potato *Phytophthora infestans* (Mont.) de Bary.

Vinay Kumar, Ramesh Singh, RK Doharey, Ramesh Chand, Sushant Srivastava and Rabindra Kumar

DOI: https://doi.org/10.22271/chemi.2020.v8.i2b.9501

Abstract
Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious diseases of potato. Several management practices have been adopted so for to minimize the disease. But in present investigation based on laboratory and glass house condition revealed that soil application and tuber seed dressing with bioformulation provided good protection against late blight and also stimulate the germination. The data showed that the plant height of potato was maximum in treatments T1(Soil application of FYM @ 125gm/pot +mushroom waste with *T. harzianum* @ 5gm/gm+tuber treatment with *Azotobacter* @ 5%+foliar spray with Ridomil @ 0.25%) with the value of 44.9 cm at 30 days age of plant. Tuber treatment with bio agents stimulated the germination per cent of the tuber. The Maximum germination per cent was noted in case of T1(Soil application of FYM @ 125gm/pot+mushroom waste with *T. harzianum*@ 5gm/kg+tuber treatment with *Azotobacter*@5%+foliar spray with Ridomil@0.25%). Growth promoting effects of the soil amendment+ tuber treatment + foliar spray were also perceived. The fungicides and bio agents were found to increase the plant length over control. Foliar spray with the fungicides pathogenic inoculation protected the plants against infection resulting reduced disease severity. The minimum disease severity (10.66) was reported from treatments were given as treatment T1(Soil application of FYM 125gm/pot+ mushroom waste with *T. harzianum* 5gm/kg +tuber treatment with *Azotobacter* @5%+foliar spray Ridomil @ 0.25%) treated plants against 82.33% disease severity in case of control. The integrated effect o FYM+ mushroom waste as soil application bioformulation as tuber 51.67gm, and total weight of tuber 338.33gm, where trea tment was given as soil application of FYM @125gm/pot+ mushroom waste with *T. harzianum*@ 5gm/kg+tuber treatment with *T. harzianum* @5%+foliar spray with 665.02gm was recorded from treatment T1(Soil application of FYM 125gm/pot +mushroom waste *T. harzianum* @ 5gm/kg+tuber treatment with *Azotobacter*@ 5%+foliar spray with Ridomil @ 0.25%).

Keywords: Late blight, *Azotobacter*, mushroom waste, *Trichoderma*

Introduction
Potato can be used as a vegetable alone or in combination with other vegetables such as cabbage, cauliflower, tomato, brinjal, beans etc. It is also used in the preparation of chips, puffs and raw pulp. It is served in meals as well as snacks preparation. Thus, potato is important for small- hold farmers as well as a cash crop. The daily need of potato is increasing day by day resulting from increasing population growth of the world. Therefore, there is a demand for more production from per capital available land. Though, production of potato is increasing continuously but productivity rate per unit area of land is very low as per other countries of the world, which has the main reason of biotic factors caused by fungi, bacteria, virus, viroid and nematodes etc. Among them late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious and destructive diseases of potato all over world, including India. The great Irish famine in 1845, due to late blight is one of the most dramatic episodes caused by a plant pathogen in human history (Khurana *et al*., 1998) [1]. The Irish famine affected food production as well as economic and social aspect of communities (Large, 1940) [2]. The disease is also the major bottleneck in potato production in Ethiopia and other parts of the world (Goodwin *et al*. 1995) [3].

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(3): 1935-1942
Received: 25-03-2020
Accepted: 29-04-2020

Vinay Kumar
SRF Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

Ramesh Singh
Retd. Assistant Professor Department of Plant Pathology, Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

RK Doharey
Professor (Extension Education) and Associate Dean ANDUA & T Kumarganj Ayodhya, Uttar Pradesh, India

Satendra Kumar
Horticulture Directorate of Extension SVPUA&T Modipuram Meerut, Uttar Pradesh, India

Corresponding Author:
Vinay Kumar
SRF Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

Evaluation of the effect of different fungicides against *Phytophthora infestans* (Mont) de Bary *(In vitro)*

Vinay Kumar, Ramesh Singh, RK Doharey and Satendra Kumar

Abstract
Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the the most serious disease of potato. Several management practices have been adopted for so for to minimize the disease. Butin the present investigation based on Laboratory condition. The efficacy of six different fungicides tested on mycelial growth of the *Phytophthora infestans* (Mont.) de Bary that minimum radial growth with 0.75 mm in diameter was recorded at 300 ppm concentration which was followed by 200 ppm, and 100ppm and 50 ppm. However, nomycelial growth recorded at 400 ppm. As per concern of percent inhibition the highest with 100 % inhibition was recorded from 400 PPM concentration of Metalaxyl. . Hence, the use of fungicides is the very effective method for management of plant disease and continuous use both systemic and even protective fungicides of fungicides may supressed growth of a develop strain of the *Phytophthora infestans* (Mont.) de Bary.

Keywords: Phytophthora, Late blight, Mycelium, Fungicides, Radial growth, ppm

Introduction
Potato (Solanumtubersom L) ranks third in importance as a food crop, following wheat and rice belonging to the family Solanaceae (Hawkes, 1989) [2]. It is considered as a good source of energy and proteins, sodium, potassium, thiamin, calcium, phosphorus, magnesium, vitamin B, folic acid and other vitamins. Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious and destructive diseases of potato all over world, including India. The great Irish famine in 1845, due to late blight is one of the most dramatic episodes caused by a plant pathogen in human history (Khurana *et al*., 1998 [3]. Worldwide losses due to late blight of potato are estimated to exceed $5 billion annually and thus the pathogen is regarded as a threat to global food security. The disease caused yield losses ranging from 31-100%.The use of fungicides is the very effective method for management of plant disease. Several management practices have been adopted for so for to minimize the disease. But in the present investigation condition use of six different fungicides tested on mycelial growth of the *Phytophthora infestans* (Mont.) de Bary. In India, late blight pathogen attacked the potato crop in severe form wherever it is grown. However, it is comparatively more devastating in Himalayan and Nilgiri hills and causes severe crop losses. In Indo-Gangetic plains, depending upon prevailing weather conditions, the early appearance of late blight of potato may seriously damage the potato crop and causing heavy loss of potato growers.

Materials and Methods
The present investigations based on Glasshouse experiment was undertaken at Department of Plant Pathology, Chandra Shekhar Azad University of Agriculture and Technology Kanpur during crop season 2016-18. The procedure and techniques applied during the course of investigations were elucidated as below:

Isolation, purification, identification and maintenance of *Phytophthora infestans* (Mont) de Bary Collection of infected plant samples
Late blight infected leaves were collected from the potato field at Vegetable Research Farm, C. S. Azad University of Agriculture and Technology, Kanpur. Infected leaves with sporulation lesions were taken from the field and washed in sterilized water. The leaves were then placed in a humidity chamber with the leaf an axial side up. They were incubated at 18±1°C in BOD, until sporulation appeared. Small pieces of infected tissue along with healthy portion from the sporulating border were cut and placed under potato slices in empty sterilized Petri-plates. The Petri-plates were incubated at 18± 1°C for 10 days until there was a growth of abundant

Indian Journal of Extension Education
Vol. 55, No. 3, 2019 (107-111)

Constraints in Respect of Formation, Implementation and Functioning of Different Women SHG Faced by the Women Self-Help Group members, Government Officials and Bank Officials' Different Women SHGs In Kanpur Dehat District (U.P.)

Shalu Gautam[1], R.K. Doharey[2], and Kamal Kishore[3]

ABSTRACT

The study was conducted in Akbarpur block of Kanpur Dehat district selected purposively. A total number of 100 respondents of women SHG were selected purposively which were selected from 20 Villages randomly. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The data revealed that the out of 8 personal constraints as perceived by women SHG women *viz*., 'lack of pertinent knowledge about new innovation' was ranked I followed by lack of awareness due to dependency on male 'ranked II, out of 7 social constraints faced by women SHG members the majority of the women SHG members were reported the constraints *viz*.,' prevailed negative social attitude about women role outside the home in rural society' ranked I followed by 'due to "parda system" women are restricted within home boundaries' ranked II, out of 4 economic constraints in were reported 'women have financial dependency on male' ranked I, followed by 'unavailability of loan facility' ranked II, out of 5 constraints in women SHG group formation faced by the women SHG members were reported 'illiteracy among women' ranked I, followed by 'lack of cooperation among women' ranked II, out of 2 constraints in functioning of women SHG were reported 'lack of leadership among members' ranked I, followed by 'lack of working ability of members' ranked II, out of 4 technological constraints maximum respondent were reported 'lack of training programmes related to women SHG' ranked I, followed by 'lack of technical knowledge of preparing of women SHG of rural women 'ranked II, out of 3 constraints of Government officials were reported 'Government not come with a special policy to create a separate cell for solving problems of women SHG' ranked I, followed by 'Government not encourage and support NGOs to attempt and create favorable policy environment for women' ranked II and out of 3 constraints in bank transaction were reported 'lack of information about banking procedures' ranked I, followed by 'rules and regulation which the members cannot fulfill' ranked II.

Key words: Constraints in respect of formation, implementation and functioning of different women SHG faced by the women self-help group members, government officials and bank officials' different women SHGs in Kanpur dehat district (U.P.)

INTRODUCTION

The Self-Help Groups (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common problems through self-help and mutual help. The SHG promotes small savings among its members and these savings are kept with a bank. This common fund is in the name of the SHG. The SHG is a group formed by the community which has specific number of members like 15 or 20. Usually, the number of members in one SHG does not exceed twenty. In such a group the poorest would come together for emergency, disaster, social reasons economic support to each other have ease of conversation, social interaction and economic interactions.

A self-help group is defined as a "self-governed, peer controlled information group of people with similar socio-economic background and having a desire to

[1,2&3] Department of Extension Education, College of Agriculture, N.D.U.A &T., Kumarganj, Ayodhya-224229 (U.P.)

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

COMPARATIVE THERAPEUTIC EFFECT OF FEEDING METHI DANA AND CEREAL BRAN IN REDUCTION OF BODY WEIGHT OF POST-MENOPAUSAL FEMALES SUFFERING FROM NIDDM

Aarti Malhosia[1*], Nitu Singh[2*] and R.K. Doharey[3]

[1]Goverment Geetanjli Girls P.G. Autonomous College, Bhopal, (M.P) India

[2]Optical Nanomaterials Lab, Department of Physics, Maulana Azad National Institute of Technology, Bhopal, (M.P.) India

[3]Professor (Extension Education) & Assoc. Dean, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India

Abstract

Nowadays diabetes is the most dreadful disease for humankind in the whole world. Indians are more centrally obese at a given level of BMI compared to white Caucasians and that Indians are more insulin resistant even at lower level of BMI so they are more prone to have diabetes. Consumption of cereal bran decreases the blood glucose level as its amount is inversely associated with insulin resistance.

A detailed clinical examination done on selected patients. The criteria for the selection are as follows: 1. All patients are sedentary middle aged workers. 2. Patients with complications like were not included 3. Patients selected were explained the outline and aim of the study. They were advised to have cereal bran in the form of powder. 4. We made 2 groups. Group A fed with methi dana and group B fed with cereal bran. 5. Patients were recalled after each month for the investigation to know the proper effect. 6.The investigations include Anthropometric data, GTT, blood glucose, and serum lipid profile. The test applied for clinical estimation of blood glucose is GOD-POD (glucose oxidase peroxiadse) method. So, this study proves that consumption of methi dana is effectively applicable in lowering blood glucose level than cereal bran.

Keywords: diabetes, cereal bran, methi dana, polysaccharide etc.

Introduction

Diabetes Mellitus is a chronic disease that has affected humankind throughout the world. The life span of diabetics is shorter than that of non-diabetics at nearly all ages. Diabetes has been defined as a genetically and clinically heterogeneous group of disorder all of which show glucose intolerance.[1,4,5,11]

Prevalence- Diabetes is on increase in India. The multicenter ICMR study showed a prevalence of 2.5 % in the urban and 1.8% in the rural population above the age of 15 years. One in every eight individuals in India is a Diabetic. There are 171 million people worldwide suffering from diabetes in 2000 according to World Health Organization (WHO) statistics and this number would be more than double by 2030 (WHO 2008). The disease is responsible for 3.2 million deaths every year (WHO 2008).

- Diabetes mellitus is characterized by high blood glucose level with typical manifestations of thirst, polyuria, polydipsia, and weight loss.
- It is caused by partial or total lack of insulin and alteration in carbohydrate, protein and fat metabolism that creates defects in insulin-mediated signal pathways, resulting in decreased glucose transportation from blood into muscle and fat cells.
- The major risk is vascular injury leading to heart disease, which is accelerated by increased lipid levels and hypertension. Management of diabetes includes: control of blood glucose level and lipids; and reduction of hypertension.

As this study is a comparative study of soluble and insoluble complex polysaccharides. For the study methi dana (fenugreek seed) is selected as soluble complex polysaccharide and cereal bran is used as insoluble complex polysaccharide.

Fenugreek seeds are 55 percent soluble fiber. This gel-forming fiber absorbs water as it passes through the gut and swells up, binding with the food. It delays gastric emptying, slows down carbohydrate absorption and inhibits glucose transport. Nearly 50% dry weight of seeds as well as SDF is edible dietary fiber, making it the highest concentration among all-natural sources of fiber. About 30% of SDF (w/w) is gel-forming SOLUBLE fibers similar to guar gum, psyllium husk and oat bran. The INSOLUBLE fiber (20% of SDF), is bulk-forming like wheat bran.[3,4,5]

Comparison of Fiber content in some major food grains:

COMPOSITION of NATURAL SOURCES of VEGETABLE FIBER					
Source	Total Fiber	Soluble Fiber	Insoluble Fiber	Protein	Fat
Fenugreek Seeds	46 - 48%	20 - 28%	18 - 24%	26 - 30%	4 - 8%
Soya Bean	20%	15 - 18%	3 - 5%	40 - 43%	19%
Oats	15 - 18%	7 - 8%	7 - 8%	14 - 19%	N/A
Wheat	12%	1 - 3%	9 - 11%	10 - 12%	1 - 3%
Guar Bean	40%	25%	15%	28%	10 - 15%
Psyllium seed	24 - 26%	24 - 25%	1 - 2%	5%	Trace

Several human intervention trials demonstrated that the antidiabetic effects of fenugreek seeds ameliorate most metabolic symptoms associated with type-1 and type-2 diabetes in humans by reducing serum glucose and improving glucose tolerance.[3,4]

Bran is also the part of the grain that is the most nutrient dense. It contains proteins, omega 3 and omega 6 fatty acids, and antioxidants. Cereals made from whole wheat bran, without added sugar or hydrogenated or partially hydrogenated oils, are a good source of whole grains that are high in fiber, folic acid, B vitamins, and potassium.[8,9,11] Bran is particularly rich in dietary fiber and essential fatty acids , Because of their high fiber content, they are usually very filling. It is high in nutritional content and low in calories. When bran is removed from grains, the grains lose a portion of their nutritional value.

Cereal fibers also help normalize blood glucose levels by slowing the rate at which food leaves the stomach and by delaying the absorption of glucose following a meal. Viscous fibers also increase insulin sensitivity. As a result, high intake of cereal fibers plays a role in the prevention and treatment of type 2 diabetes.[10] In addition, by slowing the rate at which food leaves the stomach, viscous fibers promote a sense of satiety, or fullness, after a meal, which helps to prevent overeating and weight gain.[7,10]

Fenugreeks seeds have fiber in it which when consumed tend to swell in the stomach and give a feeling of satiety and thus will consume less of other fatty foods in meal.

Fenugreek seeds burn fat and help absorption. They are useful for dissolving fat within the liver. They are one of nature's super-foods due to their beneficial effect on fat metabolism, blood sugar and also their cancer-fighting properties. *(Claudia Bruchtl, L.Ac, 2001)*.

Fenugreek seeds are rich in fiber, as each 1 tbsp. serving contains 3 g, which comprises half of the carbohydrates in the serving. Fiber can be beneficial for weight loss, as it helps keep your blood sugar levels in

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

COMPARATIVE THERAPEUTIC EFFECT OF FEEDING METHI DANA AND CEREAL BRAN IN LOWERING OF BLOOD GLUCOSE LEVEL OF POST-MENOPAUSAL FEMALES SUFFERING FROM NIDDM

Aarti Malhosia[1*], Nitu Singh[2*], R. K. Doharey[3] and Sadhna M. Singh[4]

[1]Goverment Geetanjli Girls P.G. Autonomous College, Bhopal, (M.P) India

[2]Optical Nanomaterials Lab, Department of Physics, Maulana Azad National Institute of Technology, Bhopal, (M.P.) India

[3]Professor (Extension Education) & Assoc. Dean, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India

[4]Department of Chemistry, Barkatullah University, Bhopal (M.P.), India

Abstract

Nowadays diabetes is the most dreadful disease for humankind in the whole world. Indians are more centrally obese at a given level of BMI compared to white Caucasians and that Indians are more insulin resistant even at lower level of BMI so they are more prone to have diabetes. Consumption of cereal bran decreases the blood glucose level as its amount is inversely associated with insulin resistance.

A detailed clinical examination done on selected patients. The criteria for the selection are as follows. 1. All patients are sedentary middle aged workers. 2. Patients with complications like were not included 3. Patients selected were explained the outline and aim of the study. They were advised to have cereal bran in the form of powder. 4. We made 2 groups. Group A fed with methi dana and group B fed with cereal bran. 5. Patients were recalled after each month for the investigation to know the proper effect. 6.The investigations include Anthropometric data, GTT, blood glucose, and serum lipid profile. The test applied for clinical estimation of blood glucose is GOD-POD (glucose oxidase peroxiadse) method.

So, this study proves that consumption of methi dana is effectively applicable in lowering blood glucose level than cereal bran.

Keywords: diabetes, cereal bran, methi dana, polysaccharide etc.

Introduction

Diabetes Mellitus is a chronic disease that has affected humankind throughout the world. The life span of diabetics is shorter than that of non-diabetics at nearly all ages. Diabetes has been defined as a genetically and clinically heterogeneous group of disorder all of which show glucose intolerance.[1,4,5,11]

Prevelance- Diabetes is on increase in India. The multicenter ICMR study showed a prevalence of 2.5 % in the urban and 1.8% in the rural population above the age of 15 years. One in every eight individuals in India is a Diabetic. There are 171 million people worldwide suffering from diabetes in 2000 according to World Health Organization (WHO) statistics and this number would be more than double by 2030 (WHO 2008). The disease is responsible for 3.2 million deaths every year (WHO 2008).

- Diabetes mellitus is characterized by high blood glucose level with typical manifestations of thirst, polyuria, polydipsia, and weight loss.
- It is caused by partial or total lack of insulin and alteration in carbohydrate, protein and fat metabolism that creates defects in insulin-mediated signal pathways, resulting in decreased glucose transportation from blood into muscle and fat cells.
- The major risk is vascular injury leading to heart disease, which is accelerated by increased lipid levels and hypertension. Management of diabetes includes: control of blood glucose level and lipids; and reduction of hypertension.

As this study is a comparative study of soluble and insoluble complex polysaccharides.for the study methidana(fenugreek seed) is selected as soluble complex polysaccharide and cereal bran is used as insoluble complex polysaccharide.

Fenugreek seeds are 55 percent soluble fiber. This gel-forming fiber absorbs water as it passes through the gut and swells up, binding with the food. It delays gastric emptying, slows down carbohydrate absorption and inhibits glucose transport. Nearly 50% dry weight of seeds as well as SDF is edible dietary fiber, making it the highest concentration among all-natural sources of fiber. About 30% of SDF (w/w) is gel-forming SOLUBLE fibers similar to guar gum, psyllium husk and oat bran. The INSOLUBLE fiber (20% of SDF), is bulk-forming like wheat bran.[3,4,5]

Comparison of Fiber content in some major food grains:

COMPOSITION of NATURAL SOURCES of VEGETABLE FIBER					
Source	**Total Fiber**	**Soluble Fiber**	**Insoluble Fiber**	**Protein**	**Fat**
Fenugreek Seeds	46 - 48%	20 - 28%	18 - 24%	26 - 30%	4 - 8%
Soya Bean	20%	15 - 18%	3 - 5%	40 - 43%	19%
Oats	15 - 18%	7 - 8%	7 - 8%	14 - 19%	N/A
Wheat	12%	1 - 3%	9 - 11%	10 - 12%	1 - 3%
Guar Bean	40%	25%	15%	28%	10 - 15%
Psyllium seed	24 - 26%	24 - 25%	1 - 2%	5%	Trace

Several human intervention trials demonstrated that the antidiabetic effects of fenugreek seeds ameliorate most metabolic symptoms associated with type-1 and type-2 diabetes in humans by reducing serum glucose and improving glucose tolerance.[3]

Bran is also the part of the grain that is the most nutrient dense. It contains proteins, omega 3 and omega 6 fatty acids, and antioxidants. Cereals made from whole wheat bran, without added sugar or hydrogenated or partially hydrogenated oils, are a good source of whole grains that are high in fiber, folic acid, B vitamins, and potassium.[8, 9, 11] Bran is particularly rich in dietary fiber and essential fatty acids. Because of their high fiber content, they are usually very filling. It is high in nutritional content and low in calories. When bran is removed from grains, the grains lose a portion of their nutritional value.

Cereal fibers also help normalize blood glucose levels by slowing the rate at which food leaves the stomach and by delaying the absorption of glucose following a meal. Viscous fibers also increase insulin sensitivity. As a result, high intake of cereal fibers plays a role in the prevention and treatment of type 2 diabetes.[10] In addition, by slowing the rate at which food leaves the stomach, viscous fibers promote a sense of satiety, or fullness, after a meal, which helps to prevent overeating and weight gain.[7,10]

Materials and Methods

A detailed clinical examination was carried out and recorded. The criteria for the selection of patients are as follows:

- All patients are sedentary middle aged postmenopausal females.
- Patients with complications were not included.

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

COMPARATIVE THERAPEUTIC EFFECT OF FEEDING METHI DANA AND CEREAL BRAN IN LOWERING OF BLOOD CHOLESTEROL LEVEL OF POST-MENOPAUSAL FEMALES SUFFERING FROM NIDDM

Aarti Malhosia[1*], Nitu Singh[2*] and R. K. Doharey[3]

1Goverment Geetanjli Girls P.G. Autonomous College, Bhopal, (M.P.) India
2Optical Nanomaterials Lab, Department of Physics, Maulana Azad National Institute of Technology, Bhopal, (M.P.) India
3Professor (Extension Education) & Assoc. Dean, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., India

Abstract

Nowadays diabetes is the most dreadful disease for humankind in the whole world. Indians are more centrally obese at a given level of BMI (Body Mass Index) compared to white Caucasians and that Indians are more insulin resistant even at lower level of BMI so they are more prone to have diabetes. Consumption of cereal bran decreases the blood glucose level as its amount is inversely associated with insulin resistance.

A detailed clinical examination done on selected patients. The criteria for the selection are as follows:

1. All patients are sedentary middle aged workers.
2. Patients with complications like were not included.
3. Patients selected were explained the outline and aim of the study. They were advised to have cereal bran in the form of powder.
4. We made 2 groups, Group A fed with methi dana and group B fed with cereal bran.
5. Patients were recalled after each month for the investigation to know the proper effect.
6. The investigations include Anthropometric data, GTT, blood glucose, and serum lipid profile.

So, this study proves that consumption of methi dana is effectively applicable in lowering blood cholesterol level than cereal bran.

Keywords: diabetes, cereal bran, methi dana, polysaccharide etc.

Introduction

Diabetes Mellitus is a chronic disease that has affected humankind throughout the world. The life span of diabetics is shorter than that of non-diabetics at nearly all ages. Diabetes has been defined as a genetically and clinically heterogeneous group of disorder all of which show glucose intolerance.[4,5,11]

Prevelance- Diabetes is on increase in India. The multicenter ICMR study showed a prevalence of 2.5 % in the urban and 1.8% in the rural population above the age of 15 years. One in every eight individuals in India is a Diabetic. There are 171 million people worldwide suffering from diabetes in 2000 according to World Health Organization (WHO) statistics and this number would be more than double by 2030 (WHO 2008). The disease is responsible for 3.2 million deaths every year (WHO 2008).

- Diabetes mellitus is characterized by high blood glucose level with typical manifestations of thirst, polyuria, polydipsia, and weight loss.
- It is caused by partial or total lack of insulin and alteration in carbohydrate, protein and fat metabolism that creates defects in insulin-mediated signal pathways, resulting in decreased glucose transportation from blood into muscle and fat cells.
- The major risk is vascular injury leading to heart disease, which is accelerated by increased lipid levels and hypertension. Management of diabetes includes: control of blood glucose level and lipids; and reduction of hypertension.

As this study is a comparative study of soluble and insoluble complex polysaccharides. For the study methi dana (fenugreek seed) is selected as soluble complex polysaccharide and cereal bran is used as insoluble complex polysaccharide.

Fenugreek seeds are 55% soluble fiber. This gel-forming fiber absorbs water as it passes through the gut and swells up, binding with the food. It delays gastric emptying, slows down carbohydrate absorption and inhibits glucose transport. Nearly 50% dry weight of seeds as well as SDF is edible dietary fiber, making it the highest concentration among all-natural sources of fiber. About 30% of SDF (w/w) is gel-forming SOLUBLE fibers similar to guar gum, psyllium husk and oat bran. The INSOLUBLE fiber (20% of SDF), is bulk-forming like wheat bran.[1,4,5]

Comparison of Fiber content in some major food grains

COMPOSITION of NATURAL SOURCES of VEGETABLE FIBER					
Source	**Total Fiber**	**Soluble Fiber**	**Insoluble Fiber**	**Protein**	**Fat**
Fenugreek Seeds	46 - 48%	20 - 28%	18 - 24%	26 - 30%	4 - 8%
Soya Bean	20%	15 - 18%	3 - 5%	40 - 43%	19%
Oats	15 - 18%	7 - 8%	7 - 8%	14 - 19%	N/A
Wheat	12%	1 - 3%	9 - 11%	10 - 12%	1 - 3%
Guar Bean	40%	25%	15%	28%	10 - 15%
Psyllium seed	24 - 26%	24 - 25%	1 - 2%	5%	Trace

Materials and Methods

Bran is also the part of the grain that is the most nutrient dense. It contains proteins, omega 3 and omega 6 fatty acids, and antioxidants. Cereals made from whole wheat bran, without added sugar or hydrogenated or partially hydrogenated oils, are a good source of whole grains that are high in fiber, folic acid, B vitamins, and potassium.[8,9,11] Bran is particularly rich in dietary fiber and essential fatty acids, Because of their high fiber content, they are usually very filling. It is high in nutritional content and low in calories. When bran is removed from grains, the grains lose a portion of their nutritional value.

In people with type II diabetes, fenugreek supplementation has been shown to significantly lower overall cholesterol, low-density lipoprotein (known as LDL or "bad cholesterol," associated with cardiovascular disease), and triglycerides (blood fats) all while easing diabetic symptoms *(Alternative Medicine Review 2003)*. In another study of non-diabetics suffering from high cholesterol, fenugreek was found to significantly lower triglycerides and LDL levels *(Phytotherapy Research 1991)*[12,13]

Fenugreek seeds contain chemicals that may lower cholesterol absorption from the intestines and also possibly decrease the amount of cholesterol made by the liver. The dietary fiber in fenugreek may also add to fenugreek's cholesterol-lowering effects. According to the PAMF (Palo Alto Medical Foundation), preliminary human studies have shown that fenugreek may decrease total cholesterol, low density lipoprotein, which is known as bad cholesterol, and triglycerideWhole grain cereals are a good source of fiber, which helps keep your digestive system regular, and they also have cholesterol lowering

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

COMMUNICATION AND PSYCHOLOGICAL BEHAVIOR OF THE OKRA GROWERS IN KANNAUJ DISTRICT (U.P.)

Kamal Kishore[1], Prakash Singh[1], R.K. Doharey[3]& Shalu Gautam[4]
[1,2,3&4]Department of Extension Education, College of Agriculture,N.D.U.A &T.,Kumarganj, Ayodhya (U.P.)- 224229

Abstract

The study was conducted in Chhibramau and Talgram blocks of Kannauj district (UP) selected purposively, because these blocks one more popular for area and production of okra. A total number of okra growers were selected through random sampling from eight selected village's panchayats on the basis of ten respondents from each selected village panchayats. The some structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The results of the study depicted that the majority of the respondents were found in various Communication and psychological behavior characters like, The radio was found as main communication media with the respondents. Thus, it may be concluded that the degree of independent variable is increases the level of knowledge and adoption about scientific okra cultivation will increase towards positive. The maximum number of respondents was found in low level of economic motivation, medium level risk Orientation and scientific orientation high (32.50%), (23.75%) and (21.00%) respondents, respectively.

Key words : Socio-economic profile, knowledge and adoption, awareness, etc.

Introduction

Agriculture helps to meet the basic needs of human and their civilization by providing food, clothing, shelters, medicine and recreation. Hence, agriculture is the most important enterprise in the world. It is a productive unit where free gifts of nature namely land, light, air, temperature and rain water etc., are integrated into single primary unit indispensable for human beings. Secondary productive units namely animals including livestock, birds and insects, feed on these primary units and provide concentrated.

Agriculture has been back bone of the Indian economy and accounted for 14.6 per cent of the country's gross domestic product (GDP) in 2009-10 and 10.23 per cent of the total exports. Agriculture sector provided employment to 58.2 per cent of the work force of India.

The total geographical area of India is 328.7 million hectares of which 140.3 million hectares is net sown area, while 193.7 million hectares is the gross cropped area (Anonymous, 2009-10). India is the world's largest producer of vegetable next only to China with an annual production estimated around 50.99 million tons from 4.5 million hectares. However, vegetables occupy hardly 2 per cent of the total cropped area of the country which is very low in view of the national need. The production per unit area of various crops grown in India is very less, as compared to developed countries. Due to low agricultural productivity, it becomes very difficult to feed the ever-increasing population. Increasing is production and productivity is essential to uplift the socio economical level of poor farmers. The basic challenge before India is to enhance the production of nutritious food in sustainable manner which, besides feeding the country's large population, it can play a major role to reduce the mal nutrition among the women and children of rural area. Vegetables being short duration crops can give six to ten time more yield than any cereals crop in a year and thus, can provide cash money to the rural farmers. The vegetable being cash crop with nutritional value generate income for the poor households. Higher profits could be achieved by increasing the production of a vegetable crops throughout the year by efficient irrigation system used. The production of fruits and vegetables has comparative advantagenious particularly under conditions where arable lands are scarce, a labor is abundant and markets are accessible (Lumpkin et al., 2005).

The horticulture sector encompasses a wide range of crops e.g., fruit crops, vegetables crops, potato and tuber crops, ornamental crops, medicinal and aromatic crops, spices and plantation crops. While the first few Five Year Plans assigned priority to achieving self-sufficiency in food grain production, over the years, horticulture has emerged as an indispensable part of agriculture, offering a wide range of choices to the farmers for crop diversification. It also provides ample opportunities for sustaining large number of agro-industries which generate substantial employment opportunities. The horticulture sector contributes about 24.5 per cent of the GDP from about An area of 21 million hectares and contributes over 230 MT to the food basket of the country. India ranks first in the world with 3.5 million tones (70% of the total world production) of okra produced from over 0.35 million ha land (FAO STAT 2010).

India is the second largest producer of vegetables and is a leader in the production of peas and okra. Besides, India occupies the second position in the production of brinjal, cabbage, cauliflower and onion and third position in potato and tomato in the world. Highlighting the virtues of protected cultivation to boost 14 horticulture productivity, a Rs 30,000 crore (US$ 6.07 billion) outlay has been proposed for bringing at least 10 per cent of the horticulture crop area in India under this high-tech cultivation practice in the 12th Five Year Plan (2012-2017).

Keeping this in view, the present research project entitled "Study on knowledge and adoption level of scientific production technology of okra in kannauj district of Utter Pradesh."

Materials and Methods

The study was conducted in purposively selected kannauj district of Uttar Pradesh. There are 8 community development blocks in this district out of that is two block Chhibaramu and Talgram were selected purposively. Thetotal 90 villages in Chhibaramau block and 85 villages in Talgram block, 8 villages (4 villages from Chhibaramau block and 4villages from Talgram block) were selected purposively.The number of total villages were 175 from which 8 villages were selected purposively, and then the list of total farmers were prepared for each selected villages. Thereafter 80 farmers were selected as respondents though random sampling techniques with respect to the categories of the farmers for each selected village. Data were collected with the help of semi-structured interview schedule specially developed on standard scales with some modifications in the light of objectives and analyzed with suitable statistical methods respectively.

Results and Discussion

Communication media possession:

Table 1.1: Distribution of the respondents on the basis of communication media possession N=80

S.No.	Communication media	Respondents	
		Number	Percentage
	T.V.	80	100
	Radio	32	40.00
	Mobile phone	80	100
	Tape recorder	00	00.00

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SOCIO ECONOMIC PROFILE OF THE OKRA GROWERS IN KANNAUJ DISTRICT (U.P.)

Kamal Kishore[1], Prakash Singh[2], R.K. Doharey,[3] Kaushik Prasad[4] & Shalu Gautam[5]
[1,2,3,4&5]Department of Extension Education, College of Agriculture, N.D.U.A.&T., Kumarganj, Ayodhya (U.P.)- 224229

Abstract

The study was conducted in Chhibramau and Talgram blocks of Kannauj district (UP) selected purposively, because these blocks one more popular for area and production of okra. A total number of okra growers were selected through random sampling from eight selected village's panchayats on the basis of ten respondents from each selected village panchayats. The some structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The results of the study depicted that the majority of the respondents were found in various socio-economic profile characters like, age composition of 45-55 years (68%), literate (80%), other backward caste (60%), nuclear families (58.75%), families size of 6-7 members (55%) and size of land holding small farmers categories 1-2 ha. (53%), respectively. Agriculture was observed as main and dairying was subsidiary occupations with (82%) and (70%) and (47%) respondents were found such who had earning annual income of (Rs. 25001-350000) and (87%) respondents reported having mixed type house, respectively. The maximum (28.75%) respondents were found such show had participation in one social organization. The cycle has immersed most important transportation growers.

Key words : Socio-economic profile, knowledge and adoption, awareness, etc.

Introduction

Indian subcontinent is endowed with favorable climate which permits growing of vegetables throughout the year. Vegetables play an important role in balanced nutrition as they are valuable source of carbohydrates, proteins, vitamins and minerals. The Per capita consumption of the vegetables in India is 160 g per day per person as against recommendation of 300 g per day per person. According to this statistic, we need to produce approximately 0.3 MT of vegetables per day for the present population. The present earning through vegetables export is little bit exceeding to Rs. 300 crores. Nature has endowed our country with vast diversity of land, soil and agro-climatic conditions which enables to produce varied types of vegetable crops. The area and production of vegetables are increasing year after year after the green revolution. There is substantial increase in production and productivity of vegetable crops. Due to growing of improved hybrid varieties and adoption of improved cultivation technologies, India"s share in the world production of vegetables is about 7 per cent (Anonymous, 1999).

Okra or ladies finger is an important vegetable of the tropical countries and most popular in India, Nigeria, Sudan, Iraq, Pakistan, etc. Okra is found in it's wild state on the alluvial banks of the Nile and the Egyptians were the first to cultivate it in the basin of the Nile (12'th century BC). It was propagated then through North Africa to the Mediterranean, the Balkans, and India. It arrived then in the America at Brazil (1658), Dutch Guinea and at New Orleans before extending in the United States and going up to Philadelphia in 1781. Its scientific name is "Abelmoschus esculents" and also "Hibiscus esculents", it belongs to the family Malvaceae. It is a tropical plant, 15 which grows best in warmer climates. It"s ready to harvest in around 60 days when the blooms begin to open, and is slightly tough. They have to be picked about 4-5 days after flowering in the fall. Okra varies in shades of green and can be smooth or has ribbed surfaces. (Varmudy, 2010).

Area and production of okra in India is 452,000 ha. and 4,803,000 MT. in Nigeria 387,000 ha. and 1,039,000 MT. and in Sudan 21,926 ha. and 223,650 MT. Here the share of India is 67.1 per cent, followed by Nigeria at 15.4 per cent and Sudan at 9.3 per cent. (FAO, 2010). In India, okra is grown throughout except in the mountain regions. The major producers are West Bengal, Bihar, Orissa, Andhra Pradesh and Gujarat. As far as area under okra cultivation in India is concerned, Orissa has an area of 74 thousand ha, West Bengal has an area of 73.1 thousand ha under okra cultivation followed by Gujarat, Andhra Pradesh, Jharkhand and others states. In terms of okra production, it is 0.83 million tones in West Bengal, 0.65 million tones in Orissa and 0.43 million tonnes in Andhra Pradesh. The average productivity in India is 10.5 tones per hectare. The highest productivity is in Andhra Pradesh at 15 tones per hectare followed by Jharkhand at 14 tones per hectare. The total area under this crop has increased over the years.

We eat food for good growth of our body. The food we eat contains nourishing substances called nutrients. There are five major nutrients, namely carbohydrates, proteins, fats, minerals and vitamins. It has an average nutritive value of 3.21 gm, which is higher than tomato, pumpkin and ashgourd. It contains 27 gm of carbohydrates, 2.2 gm of proteins, 0.29 gm of fat, 90 mg of calcium, 50 mg of phosphorus, 15 mg of iron and 16 mg of vitamin C per 100 gm of edible portion. The seeds contain 18-20 per cent oil and 20-23 per cent crude protein. Soups and stews of okra are popular dishes in India. The seeds, when ripe are sometimes roasted and used 16 as a substitute for coffee. The roots and stems of okra are used for clarification of sugarcane juice before it is converted into jaggery and brown sugar. The crop is used in the paper industry and fiber is extracted from its stem. Okra is considered by many as a super-vegetable with a lot of nutrition and medicinal benefits. Fibre also helps in stabilizing blood sugar. The mucilage not only binds cholesterol but also the bile acid carrying toxins dumped into it by the liver. Its fiber absorbs water and helps to prevent constipation. In fact, its slippery characteristics, which people dislike, facilitates elimination of excess cholesterol and toxins from the body.

There are many medicinal importance of okra; (i) The tender fruit is boiled and administered in fevers, gastric ulcers, catarrh, inflammation of the mucous membrane, difficulty in urination and dysentery. (ii) It is also considered remedy for spermatorrhea (involuntary discharge of the semen), syphilis, gonorrhea, and other disorders of the genitals. (iii) The fruit is also reported to increase sexual potency. (iv) The unripe fruit is eaten for tuberculosis of the lungs. (v) The infusion of the seeds will induce perspiration etc.

Okra can be grown in a wide range of soils – sandy loams to clay loams, provided they are well drained and supplied with enough organic matter. Main Okra growing season is Kharif (rainy season) June-July. However, it can be grown in September-October, January-February and also in summer season, where assured irrigation facilities are available (www.mdaagronet.com). Out of 137.00 lakh hectares geographical area of Chhattisgarh, 43 per cent area comes under cultivation. On the basis of climate and topography the state is divided into three agro climatic zones i.e. Chhattisgarh plains, Northern hills and Bastar Plateau. Horticulture exports has helps the country to earn 14,000 crore tones in the year of 2011-2012. Indian horticulture has crossed of production all time of over 240 million tones in the year of 2011-2012.Keeping this in view, the present research entitled "To study the personal socio-economic profile of okra growers"

Materials and Methods

The study was conducted in purposively selected kannauj district of Uttar Pradesh. There are 8 community development blocks in this district out of that is two block Chhibaramu and Talgram were selected purposively. The total 90 villages in Chhibaramau block and 85 villages in Talgram block. 8 villages (4 villages from Chhibaramau block and 4villages from Talgram block) were selected purposively.The number of total villages were 175 from which 8

SOYBEAN: A HEALTHY NUTRITIOUS COMPLETE FOOD FOR VEGETARIANS

Mayur Gautam*, Shrestha Gautam, R.K. Doharey***& Priti Rai******
* Institute of Management Studies, Devi Ahilya Vishwa Vidyalaya, Indore (M.P).
** Institute of Management Studies, Devi Ahilya Vishwa Vidyalaya, Indore (M.P).
***Professor (Ext. Edu.) & Assoc. Dean, NDUAT, Kumarganj, Ayodhya,(UP)
****Assistant Professor, Department of Management Studies, G.H. Raisoni College of Engineering

Abstract

The soybean (*Glycine max*.) was introduced in India in 1960s .The area under soybean was only 32000 hectare during in 1970s. It has been increased many fold and still there is vast potential of area expansion and productivity enhancement, however, area and production of soybean is stagnating since last 10 years at around 10 to 11 million hectare and production at around 10 to 12 Million Tones. Soybean cultivation has been expended in many countries because of its nutritive and economic importance and diverse domestic usage. India's share in the world's total area is about one percent and in production about 0.38 % at present, however, area expansion as well as production of Soybean in the country during the last 40 years is rated as one of the striking occurrences in the agricultural development process. It is a prime source of vegetable oil in the international mark. Proximate composition of soybean whole seed contains 18-22% Oil, 39-42% Protein, 31-37% Carbohydrates, 4.9-5.0% Ashes. Out of total oilseed production of 29.25 Million Tones, we produce 11.54 Million Tones soybean, which is 39 % of total production. Similarly, Soy oil is a primary source of edible oil and has 19% share in total consumption of vegetable oils in our country. Our domestic production of Soybean Oil is 1.66 M.T and consumption is 4.64 M.T. To meet our domestic requirement, country is importing around 3.00 Million Tones Soybean oil annually by incurring about 19000/- crores. The average globally, area, production and productivity of soybean is around 116.48 M hectares, 303.06 M T, 26.02 qtls/ha. respectively during 2013-16. The major five countries like USA, Brazil, Argentina, India and China account for more than 87% area and 90% production of soybean globally. The three major countries i.e USA, Brazil and Argentina alone comprising 71.13 % area 82% Production of Soybean globally.

Introduction

Soybean is one among the major industrial and food crops grown in every continent. Soybean cultivation has been expended in many countries because of its nutritive and economic importance and diverse domestic usage. It is also a prime source of vegetable oil in the international mark. Proximate composition of soybean whole seed contains 18-22% Oil, 39-42% Protein, 31-37% Carbohydrates, 4.9-5.0% Ashes. The fatty acid composition of soybean oil includes Palmitic (7-12%), Stearic (2-5.5%), Oleic (19-30%) and Linoleic (48-58%). The oil of Soybean has 85% unsaturated fatty acids, considered to be cholesterol-free. Similarly, among the essential amino acids, it has lysine, Methionine, Cysteine, Tryptophan, Threonine, Isoleucine and Leucine, which are considered to be very good for human health. The soybean contains very little of starch (4.66-7%) and quite a lot of Hemicellulose and Pectins. These Polysaccharides have several health benefits in human's life. Both play an important role in preventing certain type of cancer and helping in digestion and weight loss.

Protein of soybean products characterized much quantity of lysine, Tryptophan, Isoleucine, Valine and Threonine. Number of Nutraceutical compounds such as Isoflavons, Tocopherol and lecithin has made it one of the most valuable agronomic crops in the world. Soybean has great potential as exceptionally nutritive and very rich protein food. Soybean oil has an important fatty acid, lecithin as well as vitamin A and D. Lecithin is used for reducing fatty build-up in the liver and treating memory disorders such as dementia and Alzheimer's disease. It is pertinent to mention that 90% of Indians are deficient of Vitamin –D. Soybean oil is very good for Vitamin – D diffident people. It can supply much needed protein to human diet, because, it contains 40% protein of superior quality and all the essential amino acids similar to cow milk and animal proteins. In view of its nutritional values, it is a complete food for vegetarians

It improves soil fertility being leguminous crop. Soybean is capable of transforming nearly 60-100 kg atmospheric nitrogen in to 30-40 kg nitrogen per hectare in the soil, controls the *Striga hermonthica*, a parasitic weed and also provides protein rich fodder for the animals and soybean cake for egg layering birds. It is a rich protein food used in the form of Soy oils, nutri- nuggets, tofu, soy-milk, soy-cheese, soy-fish, soya-flour, Soya-chaap, Soya-noodles and so on. It has largest consumption among the vegetable oil in the world as well as in the Country. As per FAO's Agricultural Market Information System, global production of soybean during 2018-19 is estimated at 359.6 million tonnes, a new record, from an area of 129.27 million hectares. Production estimates for 2017-18 has been revised slightly upward to 337.9 million tonnes recently from 336.8 million tonnes projected during March, 2018 from an area of 124.25 million ha.

Out of total oilseed production of 29.25 Million Tones (Avg. 2011-16), we produce 11.54 Million Tones soybean, which is 39 % of total production. Similarly, Soy oil is a primary source of edible oil and has 19% share in total consumption of vegetable oils in our country. Our domestic production of Soybean Oil is 1.66 M. T and consumption is 4.64 M.T. To meet our domestic requirement, country is importing around 3.00 Million Tones Soybean oil annually by incurring about 19000/- crores.

2. Global Scenario:

The average globally, area, production and productivity of soybean is around 116.48 M hectares, 303.06 M T, 26.02 qtls/ha. respectively during 2013-16. The major five countries like USA, Brazil, Argentina, India and China account for more than 87% area and 90% production of soybean globally. The record production of soybean was estimated during 2016-17 at 349 million tones. The three major countries i.e USA, Brazil and Argentina alone comprising 71.13 % area 82% Production of Soybean globally. The average productivity of these three countries is 30 qtls per ha. as against the world average is 26.02 qtls/ha. and 10.45 qtls/ha in India. Area, production and productivity of five major soybean producing countries (2013-16) are summarized as here under:

No.	Country	Average Area (M.ha),	Average Production (M. T)	Average Yield Qtls/ha.
	USA	32.40	101.07	31.19
	Brazil	31.02	91.80	29.59
	Argentina	19.43	55.84	28.74
	India	**11.04**	**11.54**	**10.45**
	China	06.84	12.08	17.68
	Total (1 to 5)	**100.73**	**272.33**	
	Other countries	16.35	30.73	
	World	**116.48**	**303.06**	**26.02**

SOCIAL GOVERNANCE: EMPOWERING MARGINALIZED SECTIONS OF SOCIETY

Mayur Gautam*, Shrestha Gautam, R.K. Doharey***& Priti Rai******
*MBA Scholar, Institute of Management Studies, Devi Ahilya Vishw Vidyalaya, Indore (M.P)
**MBA Scholar, Institute of Management Studies, Devi Ahilya Vishw Vidyalaya, Indore (M.P)
***Professor (Ext. Edu.) & Assoc. Dean, NDUAT, Kumarganj, Ayodhya,(UP)
****Assistant Professor, Department of Management Studies, G.H. Raisoni College of Engineering

Abstract

The Social Governance is enshrined in the Indian Constitution. The Social Governance is a concept of Government in which the state plays a key role in the protection and promotion of the economic and social well-being of its citizens. The Preamble of the Constitution has used the terms like **"Socialist", "Social Economic and Political Justice", "Equality of Status and of Opportunity" Liberty of Thoughts, Expression, Belief, Faith and Worship etc,** these terms indicate that the state would extensively involve in social welfare of people, and would try to establish an egalitarian society. The Directive Principles of state policy provides guidelines to the central and state Governments of India, to be kept in mind while framing laws and policies. The concept behind Directive Principles of State Policy is to establish a "welfare State" rather than a police state such as of Colonial era. In other words motive behind inclusion of Directive Principle of State Policy is establish Social and economic democracy rather than political democracy. However, it has been observed that the state is shirking from the duties and responsibilities of a welfare state and resources are being accumulating in certain business houses. The rich are becoming richer and poor are not getting their due share. The benefits of the schemes and provisions are not reaching to the real needy and last person standing in the line.

Introduction

India is considered to be a welfare state and moreover the largest democracy in the world. Marginalized sections in India are generally classified by their social status in the stratified Indian society and caste based stigmatized professions for their livelihood. They are not at par in respect of education, economic position and social status in society. Among the majority community of the Hindu which represents 93 percent of population in India are included the 430 million marginalized sections especially scheduled castes, scheduled tribes and other backward classes. Women form the half of the population of the country and were and are being subjugated to male domination. Scheduled caste and scheduled tribe people live in abject poverty under deprived conditions of life in respect of health, education, nutrition, human dignity, land, livelihood, employments and minimum wages with their families sharing and dying prior to general life expectancy. Their share in demography strengthened voting democracy and their significant contributions to national productivity support the wheels of the whole country's prosperity. In return they can hardly meet both ends and the basic needs of life. Thus, all the woes of existence embrace them from birth to death beyond imagination.

In today's time it seems that the concept of social welfare has not been taken by the government as sincerely, as it must have. The attitude of the government is not very friendly and cooperative towards the people, and it is visible from the recent debate on the Lokpal Bill and the controversy relating to the determination of poverty line for poor people. The government does not seem to be sincere about its responsibility towards serving the people as many scams and irregularities have come up in the central and state governments. The skewed policies relating to the expansion of capitalism, the forceful acquisition of lands from poor peasants, and neglect for the development of agriculture and rural development are making the situation worse.

Governance:

Now even after 70 years of independence, if analyze the Governance, it reveals that maximum benefit of liberalization privatization and globalization priority programme initiated by Government in the name of economic reforms has gone to well established business houses in India. The resources of Government created since Independence in the form of Public Sector Undertakings (PSUs), Corporations, Authorities, Institutions, Manufacturing Units/ organizations involved in the development of Nation have gone in the hands of big business houses. The Government is also not willing to bear the responsibility of marginalized sections and surprisingly expecting from business houses in the name of Corporate Social Responsibility (CSR). Now all the business houses have created their own institutions to use the funds earmarked for CSR.

Histriography

Dalit historiography throws a challenge to colonial, nationalist, Marxist and right wing and even to the so-called historians of subaltern studies. In this context, Ambedkar's method of constructing the history from dalit perspective is path breaking and provides insights for contemporary historians of all shades. 'Time is infinite and earth is vast, someday there will be born a man who will appreciate what I have said'- Bhavabhuti quoted by Dr Ambedkar in his preface to 'Who were the Shudras?' One may derive Ambedkar's 'historical method' in all his major writings on Indian history, culture and philosophy. In the year 1946, Ambedkar identified five streams of thoughts among the Hindus of Indian society in his writing on 'who are Shudras' **Orthodox, Arya samajists, Respecters of law, Political minded** (Swaraj is important than social reform) and **Rationalists** (regard social reform as primary and even more important than Swaraj). Among these five classes, Ambedkar would like to identify his position with rationalist, who were arguing for social reform as immediate agenda rather than any other.

In the historical method of Ambedkar; man is the maker of history. Ambedkar evaluates the three different views on the causes of historical changes, Augustine, Buckle and Marx. According to, history is only an unfolding of divine plan in which mankind is to continue through war and suffering **Augustinian** until that divine plan is completed at the day of judgment. Ambedkar pointed out that this is not acceptable to many except theologians. For **Buckle**, history was made by geography and physics. As per **Marx**, history was the result of economic forces.

Ambedkar finds the limitations of these three arguments by holding the opinion that none of these would admit that history is the biography of great men. Indeed, they deny man any place in making of history. He considers there is a truth in Buckle and Marx, but their views do not represent the whole truth. They are quite wrong in holding that impersonal forces are everything and that man is no factor in the making of history. That these impersonal forces are a determining factor can't be denied, however, the effect of impersonal forces depends on man must also be admitted."

Dr Ambedkar's perspective:

The Government agencies do their best to alleviate their social and economic deprivation and the more they implement measures for their amelioration the greater is their plight highlighted through indigenous and outside Vaux populi. At the turn of 68th year of Indian Republic, this is high time to ponder over the problems of marginalized sections of society and their remedies with reference to Dr. Ambedkar's Perspective through Indian historiography. Dr Ambedkar said that

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

THE 2016 DEMONETIZATION IN INDIA AND ITS EFFECT OF CASHLESS TRANSACTION ON MSME SECTO...

Priti Rai[1], R.K Doharey[2], Mayur Gautam[3]& Shrestha Gautam[4]

[1]Assistant Professor, Department of Management Studies, G.H. Raisoni College of Engineering,

[2]Professor (Extension Education) & Assoc. Dean, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya-224229(UP)

[3&4]MBA Scholar, Institute of Management Studies, Devi Ahilya Vishw Vidyalaya, Indore (M.P)

Abstract

The 2016 demonetization policy in India in which the government decided to demonetize the 500 and 1000 rupee notes affected trading activities of the MSMEs in respect of payment mode by individual customers. The objective of this study is to provide insight on the significance of cashless transaction among MSMEs (micro, small and medium-sized enterprises) following the 2016 demonetization exercise in India. With convenient sampling technique the study employed 200 respondents. Primary data was mainly collected from respondents in the MSME segment in Mumbai and Bangalore and secondary data from MSME annual report 2017-18. The study noted that customers switched to alternative payment avenues and that mobile wallet companies became the biggest beneficiaries as they offered easy mode of payment via the use of mobile phone. The results of the Pearson correlation confirms that there is a positive relationship between cashless transaction and demonetization. It is therefore recommended that more and more Indian customers must be encourage to continue in the habit of making cashless business transactions on account of its enormous economic benefits to individuals, MSMEs and the Indian economy as a whole.

Key words: Demonetization, Currency notes, MSME sector, Cashless transaction, Mobile-wallet

Introduction

The act of stripping an existing currency note of its status as a legal tender and removing it completing from circulation and subsequently replacing it with new notes is known as Demonetization. Sometimes a higher or totally different denomination is introduced in place of the former currency which was pulled out from the system.

The demonetization exercise that took place in November 2016 in India came as a shock though it was not new in the country's economic history. This is because India's initial demonetization action happened in 1946, and the second one occurred in 1978. The first one which was recorded in 1946 after World War II, was believed to have been inspired by their colonial master Britain who first withdrew the British 10 pound note from circulation as a form of demonetization program.Government of countries take such anaction so as to check the activitiesof black money dealers and the evasion of tax. In 1946, the Indian government decided to demonetize high denomination currency notes of Rs. 1,000 and Rs. 10,000 but this action really did nothave much impact on Indian economy because higher denomination was not accessible to the general public.

In the year 1978 demonetization in India suggested by the Wanchoo committee, a direct tax inquiry committee (established in the 1970s). Prime minister of India Muraji Desai declared Rs 1000, Rs. 5000 and Rs 10, 000 currency notes out of circulation. Main reason of Indian 1978 demonetization was to "Freeze secret Funds" of the opposition political parties that created corruption and black money in economy. The public were given a very limited time of three days to exchange the affected currency and theIndian Prime minister publicly announced that the ban or removal of said notes was a measure against black money operations, corruption and terror financing.

Experts say that the impact of 1978 demonetization was very less because people did not have black money in hard cash as they were mostly deposited at the Swiss bank. The comment made by the citizenry also attest to the fact that many were not bothered nor affected. For example, it was reported in an interview that someone said "I never saw a Rs. 1,000 notes. I am not bothered. However, the price of gold and other commodities dropped between 5% and 10% within 7 days after the announcement of the 1978 demonetization exercise.

The recent demonetization in the year 2016 under the regime of the Indian Prime Minister Shri Narendra Modi, was activated on 8th November via an unscheduled live televised address at 8:00 PM Indian standard time. The Prime Minister declared that the use of all Rs. 1000 and Rs. 500 Mahatma Gandhi series of banknote would be illegal past midnight, he further added in his declaration that the issuance of Rs 500 and Rs. 2000 new Mahatma Gandhi series bank notes will be used in place of the old banknotes.

Government of India claimed that this action was necessary in order to curb the shadow economy and crack down on the creation of counterfeit money which is also used to fund other illegal activities such as the issue ofterrorism. The RBI governor and economic affairs **Messrs Urjit Patel and Shakti Kanta Das (2016)** noted in a press conference that one purpose of this move was to fight terrorism funded by counterfeit notes. A period of 50 days was allowed by RBI in regards to the transition of the old currency to the newly proposed notes with December 30th as the deadline todeposit the old Rs. 500 and Rs. 1000 banknotes as credit in banknotes.

1.1 Indian MSME

Micro small and medium enterprises is' no standard, universal definition. Different agencies have defined MSMEs using Different parameters like scale, number of employees working, investment in plant and equipment etc. The small and medium enterprise department of the World Bank consider "Number of employees" as the criterion for identification whereas the BASEL committee (International Settlements of Central Bank of Member Countries) stated in uses the annual sales as its parameter (BASEL Committee, 2004).

MSME play essential role in Indian the overall industrial economy of the country. In recent year the MSME higher growth rate has consistently registered compared with the overall industrial sector and dynamism.

In India highly heterogeneous in terms of its size of it enterprises numbers of products and services, and level of technology by micro small and medium enterprise. MSME sector employs and calculated near about Rs. 579 lakh people spread over the Rs. 261 lakh Enterprise. This sector accounts for 45% of the manufacturing output and near about 40% of its total export of it nation (according to 4th census of MSME sector). Today MSME sector are Exposed to great opportunities for expansion and diversification across the sectors.

1.2New Classification of MSMEs

Classification of the MSME	New Classification (annual turnover)	Previous classification – Ceiling on Investment in Plant and Machinery (in Rs)
Micro	Not exceeding Rs 5 crores	Below 25 lakhs
Small	Between Rs 5 crores to Rs 75 crores	25 lakhs to 5 crores

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SOCIO ECONOMIC PROFILE OF THE WOMEN SHGS IN KANPUR DEHAT DISTRICT (U.P.)

R.K. Doharey, Shalu gautam, Prakash Singh, Kamal Kishore and Shagufta wasim
Department of Extension Education, College of Agriculture N.D.U.A &T., Kumarganj, Ayodhya (U.P.)- 224229

Abstract

The study was conducted in Akbarpur block of Kanpur Dehat district selected purposively. A total number of 100 respondents of women SHG were selected purposively which were selected from 20 Villages randomly. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The data revealed that the maximum number of women SHG respondents *i.e.* (61%) were found in middle age (27-45years).The majority of the categories belonged to scheduled caste, the dominancy of joint family system (55%) was observed. The women SHG members (60%) had medium family size (5 to 7 members) in their families and possess small land holding position. The majority of women SHG members (59%) reported agriculture as their main occupation. respondents 68% were found such who had earning annual income of (Rs. 25001-27500/-0) and (62%) respondents reported having mixed type house, respectively. The maximum of women SHG members (62%) were found members of one organization, (25%) member of two organizations and (13%) member of more than two organizations or office bearer. The cycle has immersed most important transportation.

Key words: Socio-economic profile and awareness etc.

Introduction

The Self-Help Groups (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common problems through self-help and mutual help. The SHG promotes small savings among its members and these savings are kept with a bank. This common fund is in the name of the SHG. The SHG is a group formed by the community which has specific number of members like 15 or 20. Usually, the number of members in one SHG does not exceed twenty. In such a group the poorest would come together for emergency, disaster, social reasons economic support to each other have ease of conversation, social interaction and economic interactions.

A self-help group is defined as a "self-governed, peer-controlled information group of people with similar socio-economic background and having a desire to collectively perform common purpose. The Self-help groups have been able to mobilize small savings either on weekly or monthly basis from persons who were not expected to have any savings. They have been able to effectively recycle the resources generated among the members for meeting the productive and emergent credit needs of members of the group.

The SHGs are novel and innovative organizational setup in India for the women upliftment and welfare. All women in India are given chance to join any one of SHGs for training and development, so as to be prospective entrepreneur and skilled worker. The SHGs are promoted by the Government as if women in India may not be resourceful enough to be entrepreneurs. When the SHGs arrange training facilities to carry out certain kind of work which are suitable for women in India, bank must arrange financial assistance to carry out manufacturing and trading activities, arranging marketing facilities while the Governments will procure the product of SHGs, arrange for enhancing the capacity of women in terms of leadership quality and arranging for the management of SHGs by themselves so as to have administrative capacity. As a social movement with government support SHGs become more or less a part and parcel of the society.

The Government has been implementing various programmes which support women programmes to take up new venture and start self-employment, which has been categorized under four heads:

- Empowering strategies: Indira Mahila Yojana (IMY) Mahila Samridhi Yojana MSY: DWCRA.
- Employment and income generation: TRYSEM, Support for Training and Employment Programme (STEP) SGSY, SJSRY, Urban Self Employment Programme (USEP), JRY.
- Welfare and support services: Hostels for Working Women (HWW) Short Stay Homes (SSH), Swadhar Creches/day Care Centres for the Children of Working and Ailing Mothers.

Other enabling measures: Rashtriya Mahila Kosh (RMK), a national level mechanism to meet micro credit needs of poor and asset less women in the informal sector also known as the National Credit Fund for Women (NCFW). The total number of Self Help Groups (SHGs) promoted under National Rural Livelihoods Mission (NRLM) was 1864742 as on 31.03.2014. Their number increased to 2305513 as on 31.07.2015, recording a growth of 440771 SHGs as compared to 31.03.2014. In percentage terms, the progress made in the number of SHGs between 31.03.2014 and 31.07.2015 was 23.64%.

The SHGs have given a new lease of life to the women in villages for their social and economic empowerment. Economic development plays an important role in the development and growth of any society. The importance of promoting women to engage in economic activities is being increasingly realized in all developing countries which has two folds: of to empower the women by bringing them into the mainstream developing and improving their economic status and to provide new employment opportunities by way of income generation, self-employment and entrepreneurship to women for different socio-economic sector.

The constitution of SHGs is sometimes exclusively on particular social groups or a mix. The impact of SHGs on social harmony has also been mixed while it has been observed that the groups with mixed membership had group's leaders that came from a variety of the social groups. SHGs have impact on the community at large. There have been few instances of significant contributing to education, family planning, eradication of child labour and hygiene. The SHGs have helped their members and their communities by taking a leadership role in community development, hence SHG are perceived to be a guiding force for village. The loans that SHG members received are intended to improve their livelihood so that they can receive greater and steadier cash flows.

The concept of Self-help groups had its origin in the co-operative philosophy and the co-operators by and large, including the National Federations in the credit sector, could not think of any better SHG than a primary co-operative credit society itself, as SHG are small and economically homogenous affinity groups of rural poor, they are voluntarily coming together for achieving the: (1) To save small amount of money regularly (2) To mutually agree to contribute a common fund (3) To meet their emergency needs (4) To have collective decision making (5) To solve conflicts through collective leadership mutual discussion and (6) To provide collateral free loan with terms decided by the group at the market driven rates.

The SHG is a group of rural poor who have volunteered to organize themselves into a group for eradication of poverty of the members. The basic principles of the SHGs are group approach, mutual trust, organization of small and manageable groups, group cohesiveness, spirit of thrift, demand-based lending, collateral free, women friendly loan, peer group pressure in repayment, skill training capacity building

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

KNOWLEDGE LEVEL OF OKRA GROWERS WITH RESPECT TO SCIENTIFIC PRODUCTION TECHNOLOGY IN KANNAUJ DISTRICT (U.P.)

R.K. Doharey[1], Kamal Kishore[2], Prakash Singh[3], Shalu Gutam[4],
[1,2,3&4]Department of Extension Education, College of Agriculture, NDUA&T., Kumarganj, Ayodhya(U.P.)- 224229

Abstract

The study was conducted in Chhibramau and Talgram blocks of Kannauj district (UP) selected purposively, because these blocks one more popular for area and production of okra. A total number of okra growers were selected through random sampling from eight selected village's panchayats on the basis of ten respondents from each selected village panchayats. The some structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The results of the study depicted that the majority of the respondents were found in knowledge level field preparation (96%) were rank at 1st as far as knowledge possessed by the respondents were concerned. The insect/pest rank at 2nd rank (94%), followed by seed rate at rank 3rd (93.%), method of sowing of okra at 4th rank (92%),intercropping and weed management time of 5th (91.05%), suitable variety at rank 6th (90%), crop rotation at rank 7th (87%), irrigation management at rank 8th (86%), manure and fertilizer 9th (77%), disease control at rank 10th (73.75%), seed treatment rank 11th (61%), distance at rank 12th (58%), time of treatment 13th (51%), harvest and postharvest at rank 14th (37.05%) respectively. The overall knowledge index was calculated to be 77.62%. It can be calculated that the extent of knowledge about scientific okra cultivation seems to be satisfactory.

Key words : Knowledge level of okra growers with respect to scientific production technology.

Introduction

Indian subcontinent is endowed with favorable climate which permits growing of vegetables throughout the year. Vegetables play an important role in balanced nutrition as they are valuable source of carbohydrates, proteins, vitamins and minerals. The Per capita consumption of the vegetables in India is 160 g per day per person as against recommendation of 300 g per day per person. According to these statistics, we need to produce approximately 0.3 MT of vegetables per day for the present population. The present earning through vegetables export is little bit exceeding to Rs. 300 crores. Nature has endowed our country with vast diversity of land, soil and agro-climatic conditions which enables to produce varied types of vegetable crops. The area and production of vegetables are increasing year after year after the green revolution. There is substantial increase in production and productivityof vegetable crops. Due to growing of improved hybrid varieties and adoption of improved cultivation technologies, India"s share in the world production of vegetables is about 7 per cent (Anonymous, 1999).

Okra or ladies finger is an important vegetable of the tropical countries and most popular in India, Nigeria, Sudan, Iraq, Pakistan, etc. Okra is found in it's wild state on the alluvial banks of the Nile and the Egyptians were the first to cultivate it in the basin of the Nile (12'th century BC). It was propagated then through North Africa to the Mediterranean, the Balkans, and India. It arrived then in the America at Brazil (1658), Dutch Guinea and at New Orleans before extending in the United States and going up to Philadelphia in 1781. Its scientific name is "Abelmoschus esculents" and also "Hibiscus esculents", it belongs to the family Malvaceae. It is a tropical plant, 15 which grows best in warmer climates. It"s ready to harvest in around 60 days when the blooms begin to open, and is slightly tough. They have to be picked about 4-5 days after flowering in the fall. Okra varies in shades of green and can be smooth or has ribbed surfaces. (Varmudy, 2010).

Area and production of okra in India is 452,000 ha. and 4,803,000 MT. in Nigeria 387,000 ha. and 1,039,000 MT. and in Sudan 21,926 ha. and 223,650 MT. Here the share of India is 67.1 per cent, followed by Nigeria at 15.4 per cent and Sudan at 9.3 per cent. (FAO, 2010). In India, okra is grown throughout except in the mountain regions. The major producers are West Bengal, Bihar, Orissa, Andhra Pradesh and Gujarat. As far as area under okra cultivation in India is concerned, Orissa has an area of 74 thousand ha, West Bengal has an area of 73.1 thousand ha under okra cultivation followed by Gujarat, Andhra Pradesh, Jharkhand and others states. In terms of okra production, it is 0.83 million tones in West Bengal, 0.65 million tones in Orissa and 0.43 million tonnes in Andhra Pradesh. The average productivity in India is 10.5 tones per hectare. The highest productivity is in Andhra Pradesh at 15 tones per hectare followed by Jharkhand at 14 tons per hectare. The total area under this crop has increased over the years.

We eat food for good growth of our body. The food we eat contains nourishing substances called nutrients. There are five major nutrients, namely carbohydrates, proteins, fats, minerals and vitamins. It has an average nutritive value of 3.21 gm, which is higher than tomato, pumpkin and ashgourd. It contains 27 gm of carbohydrates, 2.2 gm of proteins, 0.29 gm of fat, 90 mg of calcium, 50 mg of phosphorus, 15 mg of iron and 16 mg of vitamin C per 100 gm of edible portion. The seeds contain 18-20 per cent oil and 20-23 per cent crude protein. Soups and stews of okra are popular dishes in India. The seeds, when ripe are sometimes roasted and used 16 as a substitute for coffee. The roots and stems of okra are used for clarification of sugarcane juice before it is converted into jiggery and brown sugar. The crop is used in the paper industry and fiber is extracted from its stem. Okra is considered by many as a super-vegetable with a lot of nutrition and medicinal benefits. Fibre also helps in stabilizing blood sugar. The mucilage not only binds cholesterol but also the bile acid carrying toxins dumped into it by the liver. Its fiber absorbs water and helps to prevent constipation. In fact, its slippery characteristics, which people dislike, facilitates elimination of excess cholesterol and toxins from the body.

There is many medicinal importance of okra; (i) The tender fruit is boiled and administered in fevers, gastric ulcers, catarrh, inflammation of the mucous membrane, difficulty in urination and dysentery. (ii) It is also considered remedy for spermatorrhea (involuntary discharge of the semen), syphilis, gonorrhea, and other disorders of the genitals. (iii) The fruit is also reported to increase sexual potency. (iv) The unripe fruit is eaten for tuberculosis of the lungs. (v) The infusion of the seeds will induce perspiration etc.

Okra can be grown in a wide range of soils – sandy loams to clay loams, provided they are well drained and supplied with enough organic matter. Main Okra growing season is Kharif (rainy season) June-July. However, it can be grown in September-October, January-February and also in summer season, where assured irrigation facilities are available (www.indiaagronet.com). Out of 137.00 lakh hectares geographical area of Chhattisgarh, 43 per cent area comes under cultivation. On the basis of climate and topography the state is divided into three agro climatic zones i.e. Chhattisgarh plains, Northern hills and Bastar Plateau. Horticulture exports has helps the country to earn 14,000 crore tones in the year of 2011-2012. Indian horticulture has crossed of production all time of over 240 million tones in the year of 2011-2012.

Keeping this in view, the present research entitled "To study the knowledge level of okra growers with scientific production technology"

Materials and Methods

The study was conducted in purposively selected kannauj district of Uttar Pradesh. There are 8 community development blocks in this

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON R)TEPSR,NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

KNOWLEDGE ABOUT FORMATION, IMPLEMENTATION AND FUNCTIONING OF DIFFERENT WOMEN SHGS IN KANPUR DEHAT DISTRICT (U.P.)

Shalu gautam[1], R.K. Doharey[2], and Prakash Singh[3]
1,2&3 Department of Extension Education, College of Agriculture, NDUA&T,Kumargani, Ayodhya(U.P.)-224229

Abstract

The study was conducted in Akbarpur block of Kanpur Dehat district selected purposively. A total number of 100 respondents of women SHG were selected purposively which were selected from 20 Villages randomly. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The data revealed that the maximum number of women SHG members (62%) had medium level of knowledge about formation, implementation and functioning of different women SHG followed by low (20%), high (18%) respectively. It is evident from the values of correlation coefficient as appeared in that out of 17 variables. The 4 variables *viz.*, annual income, social participation, extension contact, awareness about of ICT tools were found to be significant and positively correlated with degree of knowledge about formation, implementation and functioning of different women SHG at 0.05% probability and one variable 'caste' was found to highly significant and negatively correlated with degree of knowledge about formation, implementation and functioning of different women SHG at 0.01% probability. The variables like education, family type, family size, housing pattern, scientific orientation, and accessibility to computer were found to be non-significant but positive correlated with degree of knowledge about formation, implementation and functioning of different women SHG. The variable like 'caste' was found highly significant and negatively correlated with degree of knowledge about formation, implementation and functioning of different women SHG. This led to conclusion that out of 17 variables 4 variables which were significant influenced the degree of knowledge about formation, implementation and functioning of different women SHG means that as the annual income, social participation, extension contact, awareness about of ICT tools, etc.

Key words: Knowledge about formation, implementation and functioning of different women SHGs.

Introduction

The Self-Help Groups (SHG) is a small voluntary association of poor people, preferably from the same socio-economic background. They come together for the purpose of solving their common Problems through self-help and mutual help. The SHG promotes small savings among its members and these savings are kept with a bank. This common fund is in the name of the SHG. The SHG is a group formed by the community which has specific number of members like 15 or 20. Usually, the number of members in one SHG does not exceed twenty. In such a group the poorest would come together for emergency, disaster, social reasons economic support to each other have ease of conversation, social interaction and economic interactions.

A self-help group is defined as a "self-governed, peer-controlled information group of people with similar socio-economic background and having a desire to collectively perform common purpose. The Self-help groups have been able to mobilize small savings either on weekly or monthly basis from persons who were not expected to have any savings. They have been able to effectively recycle the resources generated among the members for meeting the productive and emergent credit needs of members of the group.

The SHGs are novel and innovative organizational setup in India for the women upliftment and welfare. All women in India are given chance to join any one of SHGs for training and development, so as to be prospective entrepreneur and skilled worker. The SHGs are promoted by the Government as if women in India may not be resourceful enough to be entrepreneurs. When the SHGs arrange training facilities to carry out certain kind of work which are suitable for women in India, bank must arrange financial assistance to carry out manufacturing and trading activities, arranging marketing facilities while the Governments will procure the product of SHGs, arrange for enhancing the capacity of women in terms of leadership quality and arranging for the management of SHGs by themselves so as to have administrative capacity. As a social movement with government support SHGs become more or less a part and parcel of the society.

The Government has been implementing various programmes which support women programmes to take up new venture and start self-employment, which has been categorized under four heads.

- Empowering strategies: Indira Mahila Yojana (IMY) Mahila Samridhi Yojana MSY, DWCRA
- Employment and income generation: TRYSEM, Support for Training and Employment Programme (STEP) SUSY, SJSRY, Urban Self Employment Programme (USEP), JRY.
- Welfare and support services: Hostels for Working Women (HWW) Short Stay Homes (SSH), Swadhar Creches/day Care Centres for the Children of Working and Ailing Mothers

Other enabling measures: Rashtriya Mahila Kosh (RMK), a national level mechanism to meet micro credit needs of poor and asset less women in the informal sector also known as the National Credit Fund for Women (NCFW). The total number of Self Help Groups (SHGs) promoted under National Rural Livelihoods Mission (NRLM) was 1864742 as on 31.03.2014. Their number increased to 2305513 as on 31.07.2015, recording a growth of 440771 SHGs as compared to 31.03.2014. In percentage terms, the progress made in the number of SHGs between 31.03.2014 and 31.07.2015 was 23.64%.

The SHGs have given a new lease of life to the women in villages for their social and economic empowerment. Economic development plays an important role in the development and growth of any society. The importance of promoting women to engage in economic activities is being increasingly realized in all developing countries which has two folds: of to empower the women by bringing them into the mainstream developing and improving their economic status and to provide new employment opportunities by way of income generation, self-employment and entrepreneurship to women for different socio-economic sector.

The constitution of SHGs is sometimes exclusively on particular social groups or a mix. The impact of SHGs on social harmony has also been mixed while it has been observed that the groups with mixed membership had group's leaders that came from a variety of the social groups. SHGs have impact on the community at large. There have been few instances of significant contributing to education, family planning, eradication of child labour and hygiene. The SHGs have helped their members and their communities by taking a leadership role in community development, hence SHG are perceived to be a guiding force for village. The loans that SHG members received are intended to improve their livelihood so that they can receive greater and steadier cash flows.

The concept of Self-help groups had its origin in the co-operative philosophy and the co-operators by and large, including the National Federations in the credit sector, could not think of any better SHG than a [illegible] could extend itself as SHG

Journal of Community Mobilization and Sustainable Development Vol. 15(3), 712-718, September-December, 2020

A Critical Analysis on Knowledge Level of Farmers About Using Mobile Phone

R.K. Singh[1]*, R.K. Doharey[2], M. Singh[3] and A.P. Singh[4]

[1]Subject Matter Specialist, Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi (Peppeganj), Gorakhpur, Uttar Pradesh

[2]Professor & Head, [4]Research Scholar, Department of Extension Education, NDUA&T, Ayodhya, Uttar Pradesh

[3]Assistant Professor, Department of Extension Education, UPAC, Varanasi, Uttar Pradesh

ABSTRACT

Mobile phones have reduced the gap among farmers and buyers, now farmers directly communicate with customers and get price of their products from market. Mobile phones have also provided new approach to farmers to get latest information from meteorological department for weather conditions before using pesticides in their farms. However, internet is also disseminating information regarding price and marketing of goods and farmers are receiving information within minutes from all over the world. Into consideration of the above fact the study was conducted to examine the knowledge level of farmers about using mobile phone in the Milkipur tehsil of Ayodhya district, Uttar Pradesh during the agricultural year 2015-16. Selection of the respondents had done by simple random sampling method and 25 respondents from each village had taken to make a total sample size of 250 from the list of ten purposively selected villages for collection of primary data.

Keywords: Knowledge, Mobile phone, Primary data, Purposively, Simple random sampling

INTRODUCTION

In the 21st century agriculture is one of the divers industry which are increasing rural income as well as long term stability of its natural resources. This can create different activities which will affect farmers, stakeholder, customers and government industries. Information and communication technologies have transferred most important information about agriculture in developing countries. These developing countries now are connected with developed nations and getting the latest information and technologies regarding weather, natural resources and other related information (Rao, 2007).

In August 1995, the Chief Minister of West Bengal, Shri Jyoti Basu ushered in the cell phone revolution in India by making the first call to Union Telecom Minister Sukhram. Sixteen years later 4th generation services were launched in Kolkata. In India, out of every hundred citizens there are ninety people with mobile phone. A report by Kantar IMRB ICUBE (2018) highlighted that the number of internet users is 566 million as of December 2018. The report also finds that 87 per cent of the total user base, or 493 million Indians, are defined as regular users. Of this, 293 million active internet users reside in urban India, while there are 200 million active users in rural India. Not surprisingly, 97 per cent of users access the internet on their mobile device. According to the report, digital adoption is now being propelled by rural India. It is estimated that users in rural India are expected to reach 290 million by the end of 2019.

There are several reasons why mobile phones are considered as particularly important for development. First, beyond basic connectivity, mobile phones offer benefits such as mobility and security to owners (Donner, 2006). Second, due to their unique characteristics, the mobile phone is an especially good leap frogger: it works using the radio spectrum, as such there is no need to rely on physical infrastructure such as roads and phone wires, and base-stations can be powered using their own generators in places where there is no electrical grid (Economist, 2008). Third, mobile phones only require basic literacy, and therefore are accessible to a large segment of the population. Fourth, mobiles enjoy some technical advantages that make them particularly attractive

*Corresponding author email id: rahulrrext91@gmail.com

Biological Forum – An International Journal 13(2): 01-07(2021)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Review on Frontline Demonstration of KVK and its Effect on Yield, Economics, Income and Management Practices of Different Crops in India

*Shesh Narain Singh[1], Manoj Kumar[2], *M. P. Gautam[3] and R. K. Doharey[4]*
[1]*SMS, Krishi Vigyan Kendra, Sohna, Siddharthnagar, ANDUAT, Narendra Nagar, Ayodhya, India- 224229. (U.P.), India.*
[2]*Gest Faculty, Department of Extension Education, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.), India.*
[3]*Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.), India.*
[4]*Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Ayodhya, (U.P.), India.*

(Corresponding author: M. P. Gautam)*
(Received 12 March 2021, Accepted 26 May, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Field demonstration is the elderly concept of Front-Line Demonstration. FL Devolved by the Indian Council of Agriculture Research with the beginning of the Technology operation on Oilseed Crops during mid-eighties. Field demonstrations carry out close regulation of scientists of National Agriculture Research System recognized as frontline demonstrations because technologies are demonstrated in front of farmer by the scientists before being fed into the major extension method of the State Department of Agriculture. Adoption level of the beneficiaries were medium to high even as non-beneficiaries were found small level of adoption are enhanced production practice of mustard crop, proper training and extension strategies to be followed maximum adoption of mustard crop in the research area. Major limitations are to improve the spread of area explicit and maintainability upgrading advancements. Decentralize specialized and dynamic power to the locale level. Make a more compelling and monetarily maintainable public expansion framework. Step up the privatization of certain innovation move exercises. This article is helpful in extension work for improving the yield, economics and income of the farmer with different ideas and methods discussed.

Keyword: Frontline Demonstration, KVK, Yield, economics, growth, management practices and India.

INTRODUCTION

The Krishi Vigyan Kendras were assigned different actions pertaining to evaluation, modification and expression of different novel technologies. This includes conduction of association of Frontline demonstration, estimation, training programmes and sophistication of different agriculture and related technologies during OFT. Extension activities and movement of Krishi Vigyan Kendras do significant movement for the farmers and useful in hole crop period. Krishi Vigyan Kendras are the base of all organizations who work for purpose of technology through refinement, evaluation and demonstration of confirmed technology under diverse "micro farming" situation in a region (Das, 2007). In the year 1991-92 Indian Government established a "Technology Mission on Pulses" to improve the pulse production and productivity through frontline demonstration. The mandate of the Krishi Vigyan Kendra (KVKs) are application of technology through refinement, demonstration and assessment of verified technologies under different "micro farming" situations in a region (Das, 2007).

Frontline demonstrations is show recently released crop protection and production technology and its running practice on the farmers field under diverse farming situation and agro-climatic regions. While demonstrating the technologies on farmer's field, the scientist are compulsory to study situation, factors and elements involving in higher crop production. Limitation of production and thereby create production data and feedback information. Frontline demonstrations were conduct in two adopted villages at pasture of 20 farmers within area of 0.4 hectare each. Moong crop was grown according to the package and practices of moong crop according field demonstration (Anonymous, 2017).

A. Additional activities to be conducted by KVKs

1. Field day
2. Kisan Mela

Plant Archives Vol. 20, Special Issue (AIAAS-2020), 2020 pp. 468-474 *ISSN 0972- 5210*

KNOWLEDGE, ADOPTION, MARKETING, INTEGRATED PEST MANAGEMENT AND ITS CONSTRAINTS OF LEGUMES GROWER IN INDIAN SCENARIO: A REVIEW

Manoj Kumar[1], M.P. Gautam[2], R. K. Doharey[3] and Shesh Narain Singh[4], Ram Singh Yadav[5] and Annu[6]

[1]Department of Extension Education, CSAUAT, Kanpur, UP
[2]Department of Entomology, SVPUAT, Meerut, UP
[3]Department of Extension Education, ANDUAT, Narendra Nagar, Ayodhya, UP
[4]Krishi Vigyan Kendra, Sohna, Siddharthnagar, ANDUAT, Narendra Nagar, Ayodhya, UP
[5]Department of Agricultural Economics, ANDUAT, Narendra Nagar, Ayodhya, UP
[6]Department of Agricultural Statistics, ANDUAT, Narendra Nagar, Ayodhya, UP

Abstract

The present study was undertaken to find out adoption of package practices, marketing, constraints, Socio economic status, integrated pest management and recommended of legumes production technology. It was found that the independent variables, education, family size, social participation, size of land holding, age, extension contact, farming situation, education, social participation and risk orientation exposure had positive and significant association with the adoption level of the respondents regarding chickpea production technology. Majority of the farmers (small, marginal and medium) had fallen in medium category adoption about recommended cultivation practices of leguminous crops. Maximum number of legume growers were experienced various constraints in adoption of IPM practices, most of the respondents' highlighted non-availability of bio-agents, non availability of inputs at proper time (herbicide, traps and bio-pesticides etc.).

Keywords: Knowledge, Adoption, Marketing, IPM, Constraints, Legumes Grower and Indian.

Introduction

India is the largest producer, importer and consumer of pulses in the world, accounting for 25% of global production, 15% trade and 27% consumption. Pulses are chief source of protein and integral part of vegetarian human diet. The per capita availability of pulses in India is @ 42 g per day against the recommended dose of pulses for adult male and female 60 g and 55 g per day respectively (Tiwari and Shivhare, 2016). A variety of pulses are being grown in India including Chickpea (40%), Pigeonpea (18%), Blackgram (11%), Greengram (9%), Lentil (8%), Field pea (5%) and others (9%) are grown on 22-24 million ha. of area, producing 13-15 Mt. of grain with an average productivity of 6-6.5 tons/ha (Kumar and Kumawat, 2019). Uttar Pradesh state has a total area of 577 thousand ha, production of 475.4 thousand tones and yield 824 kg/ha under chickpea cultivation (Anonymous, 2017).

Socio-economic features of the legume grower farmers

Socio economic status

Patodia (2002) concluded that 56.67% of the total respondents belonged to middle class status, 22.92% had lower class status and 20.41% respondents were in higher class status. Kumar *et al.* (2017) revealed that all the sampled farmers of Hamirpur district were using improved seed of pulses whereas fertilize was applied by all the sampled farmers of Chitrakut district. The plant protection measures used by all the selected farmers of Chitrakut, Jalaun and Mahoba districts. In Madhya Pradesh, about 90% selected farmers of Sagar and Tikamgarh district were using improved seed of pulses, application of DAP and pest management done by all the farmers.

Age

Patodia (2002) reveals that 66.67% of total respondent were in the middle age group of 31 to 50 years, 22.50% farmers were above 50 years, while 10.83% respondents were in 22 to 30 years age group. Jadav (2005) concluded that more than two third (76%) of the respondents were in middle and old age group.

Farming situation

Jadav (2005) concluded that the majority of the mango growers possessed medium to large size of farm holding and might have medium irrigation potentiality proportionate to their farm.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(6): 502-505
Received: 15-09-2020
Accepted: 21-10-2020

Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Prakash Singh
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Singh
SMS/Scientist, Department of Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi, Peppeganj, Gorakhpur, Uttar Pradesh, India

Rishi Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhay Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Pandey
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj

Factors influencing adoption level of farmers regarding organic farming in eastern UP

Arvind Pratap Singh, Prakash Singh, RK Doharey, RK Singh, Rishi Kumar Singh, Abhay Kumar Singh and Vikash Pandey

Abstract
This study was undertaken in three districts selected randomly from each Zone namely (1) North Eastern Plains Zone (2) Eastern Plains Zone (3) Vindhyan Zone in Eastern Uttar Pradesh. From each selected district, two blocks were selected randomly. Thereafter two villages from each block was selected randomly, thus make a total 12 villages. The majority of respondents were of middle aged and literate including formal and informal education. Highest number of the respondents (55.83%) was observed in the medium category (33 to 44) of materials possession. Majority of farmers (60.41%) had medium level of overall extent of awareness about organic farming practices. The variables like age, family size, material possession and economic motivation, were found positively correlated but not significant with adoption level regarding organic farming practices. The variables like education, caste, family type, housing pattern, land holding, occupation, income, social participation, extension contact, value orientation, risk orientation and attitude were found negatively correlated but not significant with adoption level regarding organic farming practices.

Keywords: block, proportionate, age, education, overall materials possession, organic farming practices, adoption, correlations etc

Introduction
The organic movement in India has its origin in the work of Howard who formulated and conceptualized most of the views which were later accepted by those people who became active in this movement. Organic farming is a production system which avoids, or largely excludes, the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives.

The Indian government has initiated various promotional activities, such as setting up a National Institute of Organic Farming in Ghaziabad, Uttar Pradesh, in 2003, appointment of accreditation and certifying agencies for organic farm products, developing norms for certifying organic products and providing financial support to implement promotional activities for organic farming. The task force constituted by the Government of India has also recommended the initiation of post-graduate level courses in organic farming. One of steering committee constituted by Central Government under the chairmanship of Mr. M.S. Swaminathan, Chairman, farmer's commission, has suggested taking up organic farming as a challenging national task and to take up this as a trust area of the 10th Five Year Plan. The Ministry of Commerce launched the National Organic Program in April, 2002 and processed food products export.

"Organic farming is a production system that avoids or largely excludes the use of synthetically compounded fertilizer, pesticides, growth regulators and livestock feed additives. Organic farming systems rely to the maximum extent on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilt, to support plant nutrients and control insects, weeds and other pests". (Kanel, 2005) [2].

Methodology
The present study was conducted in six blocks of three districts namely Barabanki Basti, and Prayagraj of Uttar Pradesh. Each district selected two block and find out the different independent variables and their level of adoption of organic farming practices in organic farming. Those blocks namely Masauli, bani kodar, Haraiya, Vikram jot, Phulpur and Dhanupur was selected randomly having production area of agriculture.

Hence, the present study has been designed to explore the level of adoption of organic farming

Plant Archives Vol. 20, Special Issue (AIAAS-2020), 2020 pp. 323-327 *ISSN 0972- 5210*

KNOWLEDGE EXTENT OF THE PH.D. STUDENTS ABOUT SOCIAL MEDIA IN A.N.D. UNIVERSITY OF AG. & TECHNOLOGY, KUMARGANJ, AYODHYA (U.P.) INDIA

Neyaz Mohamad Fayaz[1,2,*], R.K. Doharey[1] and N.R. Meena[1]

[1]Department of Extension Education, College of Agriculture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya-224229 (UP), India

[2]Extension Officer of Kahmard District, Bamyan, Province, Afganistan

Abstract

Now a days through social media people are easily connected to each other thus enhancing the knowledge sharing process, it shows that the usage of social media by the students and type of that use by respondents. Social media is becoming one of the most popular and most accessed media of communication these days, the world of extent knowledge require researcher to share knowledge among them with the invention of social media it utilizes information and communication technologies to improve people to people connections. With the advancement of science and technology, the world has come close to each other. Today people don't have to wait for the dissemination process but the condition is such that every social media user has become a source of information on their own. The daily news and views to which the social media user comes across cover a wide range of topics. These topics or subjects are related to the happenings of our surrounding. The whatsapp was I[st] and facebook was IInd rank Instagram that it got IIIrd ranks.

Key words: whatsapp, Facebook, Twitter, Instagram, Students.

Introduction

Social media have been defined in a variety of ways. The definition of social media as a "platform to create profiles, make explicit and traverse relationships" by Boyd & Ellison, 2008. Social media is often described by example. Social networking sites, blogs, wikis, multimedia platforms, virtual game worlds and virtual social worlds SNS in the United States social networking market (com Score, 2011). Social media are interactive computer-mediated technologies that facilitate the creation or sharing of information, ideas, career interests and other forms of expression via and networks. Social media are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders". These technologies now include blogs, wikis, media (audios, photos, videos, texts) sharing tools, networking platforms (including Facebook) and virtual worlds, Social media has brought different people from the different geographical area on one platform on which they can share their feeling, ideas, emotions, information and much more (Bryer & Zavatarro, 2001). Social media, derived from the social software movement, are a collection of Internet websites, services, and practices that support collaboration, community building, participation, and sharing (Junco *et al.*, 2010).

Methodology

Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya in the district Ayodhya (U.P.), hence the study has been purposively confined in one of its university. The particulars of the district have been furnished here has under. The district Ayodhya, is situated at 26.50°N latitude and 81.4°E longitude. Its total geographical area is 2643 square kilometer. The density of population is 1054 per square kilometer. It has five tehsils namely Faizabad, Milkipur, Bikapur Sohaval, Rudouli and community development blooks namely Sohaval, Masodha, Purabazar, Mayabazar, Milkipur, Amaniganj, Bikapur, Tarun Haringtonganj, Rudouli and Mawie At the second stage of sampling out of 11 communities development Blocks in Ayodhya district, the Milkipur development Block was selected purposively for this study because of the criteria that Acharya Narendra Deva University of Agriculture & technology, Kumarganj is situated in this Block. Community development block, Milkipur was established in 1962. This is a post stage block according to block settlement. The block has been divided into six village development officer's circle for carrying out the development activities. This block has 10 Nyan panchayats namely Inayat Nagar, Dubhiyara, Gukula, Alipur khajuri, Kuchera, Tendha, Sari, kurawan, Sufsal and Milkipur and 67 gram panchayats and 113 villages which cover a total geographical area of 2169.45 square kilometers. The total population of the Block according to 2011 census was 158,938 (78,528 Male and 80410 female), among them 25,872 males and 8,926 female were literate.

Result and Discussion

Knowledge Extent of the students about using the social media pattern

It which obvious from the Table 1 that among all of social media users by the respondents for extent knowledge and general information sources as well as about various

*Corresponding author Email: neyazmohamadfayaz@gmail.com

Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2582-2845.8339

ISSN: 2582 – 2845

Ind. J. Pure App. Biosci. (2020) *8*(5), 56-65

Research Article

Indian Journal of Pure & Applied Biosciences

Peer-Reviewed, Refereed, Open Access Journal

Socio-economic Profile of Post Graduate Students about Mass Media Utilization Pattern in State Agriculture University of Uttar Pradesh

Kamal Kishore*, R. K. Doharey, Shalu Gutam and N. R. Meena

Department of Extension Education, College of Agriculture, A.N.D.U.A &T., Kumarganj, Ayodhya (U.P.)- 224229

*Corresponding Author E-mail: kamalextensionnd@gamil.com

Received: 15.08.2020 | Revised: 23.09.2020 | Accepted: 29.09.2020

ABSTRACT

The study was conducted in year 2018 to 2020 since the investigator is studying in N.D.U.A & T, Kumargunj, Ayodhya. So were done collect the required information from N.D.U.A & T, Ayodhya, C.S.A.U.A. & T, Kanpur, S.V.P. U.A &T, Meerut and Banda University of Agriculture &Technology, Banda. College of Agriculture from each university was taken for the study purpose. Selection of the respondents purposively was done by simple random sampling method from every agriculture college for each agricultural university in Uttar Pradesh. An it's of all the students studying in P.G. classes in all four agricultural universities were prepared and out of that 30% of the students were selected as sample for study purpose. The total sample size 657 respondents, about the 30% total post graduate students sample size 197respondents were selected randomly all four universities college. The respondents were contacted personally for data collection. The results of the study depicted that the maximum number of the respondents were found in various socio-economic profile characters like, age composition of 22 to 25 years (48.22%), General caste (32.99%), Unmarried respondents (24.36%), Nuclear/ single family system (75.63%), Family size (small up 5 members) (52.79%), Land holding as small (1-2 ha.) (57.36%), House hold materials (cots) (100.0%), Communication and media possession (mobile phone) (100.0%), Farm power (diesel engine) (77.15%), Agriculture implements (Khurpi) (100.0%), Social participation (no participation) (49.74%), Parent Occupation (agriculture main) (70.05%), Annual family income (medium 36001-150000) (49.74%), Housing pattern (pucca) (49.74%), respectively.

Keywords: *Socio-economic profile, Knowledge, Awareness*

INTRODUCTION

The word "media" is derived from the word medium, signifying mode or carrier. Media is intended to reach and address a large target group or audience. The word was first used in respect of books and newspapers that is print media but with the advent of technology, media now encompasses television, movies, radio and internet. In today's world, media becomes as essential as our daily needs.

Cite this article: Kishore, K., Doharey, R.K., Gutam, S., & Meena, N.R. (2020). Socio-economic Profile of Post Graduate Students about Mass Media Utilization Pattern in State Agriculture University of Uttar Pradesh , *Ind. J. Pure App. Biosci.* *8*(5), 56-65. doi: http://dx.doi.org/10.18782/2582-2845.8339

Copyright © Sept.-Oct., 2020; IJPAB

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 9[9] August 2020 : 07-11
©2020 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

ORIGINAL ARTICLE **OPEN ACCESS**

Utilization pattern of mass media by Post Graduate students in State Agriculture University of Uttar Pradesh

Kamal Kishore[1], R.K. Doharey[1],Shalu Gutam[1], N.R. Meena[1], [2]S.N.Singh
[1]Department of Extension Education, College of Agriculture, A.N.D.U.A &T., kumarganj, Ayodhya (U.P.) – 224229
[2]KVK Sidharthnagar (U.P.)
[1]Email: kamalextensionnd@gamil.com

ABSTRACT
The study was conducted in year 2018 to 2020 since the investigator is studying in N.D.U.A & T, Kumargunj, Ayodhya. So were done collect the required information from N.D.U.A. & T, Ayodhya, C.S.A.U.A. & T, Kanpur, S.V.P. U.A &T, Meerut and Banda University of Agriculture &Technology, Banda. College of Agriculture from each university was taken for the study purpose. Selection of the respondents purposively was done by simple random sampling method from every agriculture college for each agricultural university in Uttar Pradesh. An it's of all the students studying in P.G. classes in all four agricultural universities were prepared and out of that 30% of the students were selected as sample for study purpose. The total sample size 657 respondents, about the 30% total post graduate students sample size 197respondents were selected randomly all four universities college. The respondents were contacted personally for data collection. The results of the study depicted that the maximum number of the respondents were found in various media utilization pattern shows that the majority of respondents Radio (40.60%) news, Television (48.22%) news, Laptop/Computer (27.91%) research work, Newspapers (38.07%) national news, Agril. Books (48.22%) preparation , Magazines (25.38%) farm management information, Mobiles/Cell phone/Android phone (48.22%) communication, Demonstration (43.14%) sowing new practice for student development, Film show (40.60%) transfer of new technology, Exhibition (41.62%) education, and Posters (43.14%) display of awareness in class room, respectively.
Key words: *Uses mass media pattern, collection of information and awareness etc.*

INTRODUCTION

The term media is derived from Medium, which means carrier or mode. Media denotes an item specifically designed to reach a large audience or viewers. The term was first used with the advent of newspapers and magazines. However, with the passage of time, the term broadened by the inventions of radio, TV, cinemas and Internet. In the world of today, media has become almost as necessary as food and clothing. It is true that media is playing an outstanding role in strengthening the society. Its duty is to inform, educate and entertain the people. It helps us to know current situation around the world. The media has a strong social and cultural impact upon society. Because of its inherent ability to reach large number of public, it is widely used to convey message to build public opinion and awareness. The role of media in education is evident today by the number of computer labs, television sets and libraries that have become part of curriculum in most schools today. Media comes in different forms and each form affects the way students learn and interpret information. Media has brought the world closer (globalization) so that now students from different universities in different parts of the world are connected through a mere internet connection. Amidst the information revolution m ass media has become such a massive part of our lives (2018) [1-3].

The success of agricultural development programmes in developing countries largely depends on the nature and extent of use of mass media in mobilization of people for development. The planners in developing countries realize that the development of agriculture could be hastened with the effective use of mass media. Radio,Television have been acclaimed to be the most effective media for diffusing the scientific knowledge to the masses. In a country like India, where literacy level is low, the choice of communication media is of vital importance. In this regard the television and radio are significant, as they transfer modern agricultural technology to literate and illiterate farmers alike even in interior areas,

Plant Archives Vol. 20, Special Issue (AIAAS-2020), 2020 pp. 328-332 *ISSN 0972- 5210*

UTILIZATION PATTERN OF SOCIAL MEDIA USE BY PH.D. STUDENTS IN A.N.D. UNIVERSITY OF AG. & TECHNOLOGY, KUMARGANJ, AYODHYA (U.P.) INDIA

Neyaz Mohamad Fayaz[1,2*], R.K. Doharey[1] and N.R. Meena[1]

[1]Department of Extension Education, College of Agriculture, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya-224229 (UP), India

[2]Extension Officer of Kahmard District, Bamyan, Province, Afganistan

Abstract

Social media has become ubiquitous and almost inescapable, revolutionizing the way students communicate, interact and socialize and has become an integral part of their social and cultural fabric, consequently, students are spending a substantial part their time on social media. Social media is becoming one of the most popular and most accessed media of communication these days. Social media has brought different people from the different geographical area on one platform on which they can share their feeling, ideas, emotions, and thoughts on the same platform. With the advancement of science and technology, the world has come close to each other. Today people don't have to wait for the dissemination process but the condition is such that every social media user has become a source of information on their own. The daily news and views to which the social media user comes across cover a wide range of topics. These topics or subjects are related to the happenings of our surrounding. People can like, show emotions through the list of emoticons or even comment accordingly. The social media act as an umbrella that constitutes a variety of interesting features that have our life very easier. Features of tagging friends, location sharing, photo and video uploads, message chatting, video calling, searching friends etc have made our life more engaging.

Key words: Social Media, Student, Information, Sources.

Introduction

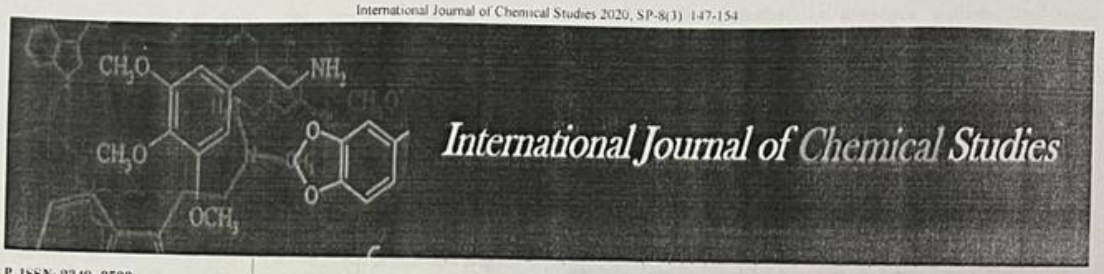
Social media are technologies that facilitate social interaction, make possible collaboration and enable deliberation across stakeholders". These technologies now include blogs, wikis, media (Audios, photos, videos, texts) sharing tools, networking platforms (including Facebook) and virtual worlds (Bryer & Zavatarro, 2001). Social media has brought different people from the different geographical area on one platform on which they can share their feeling, ideas, emotions, information and much more. The Manifold social networking sites like Face book, WhatsApp, Instagram, Twitter, LinkedIn, Google and others open the door to share ideas, views and thoughts on the same platform. With the advancement of science and technology, the world has come close to each other. Today people don't have to wait for the dissemination process but the condition is such that every social media user has become a source of information on their own. The daily news and views to which the social media user comes across cover a wide range of topics. These topics or subjects are related to the happenings of our surrounding. People can like, show emotions through the list of emoticons or even comment accordingly. The social media act as an umbrella that constitutes a variety of interesting features that have our life very easier. Features of tagging friends, location sharing, photo and video uploads, message chatting, video calling, searching friends etc have made our life more engaging (NIPFP, 2016).

Methodology

Acharya Narendra Deva University of agriculture and technology,Kumarganj, Ayodhya in the district Ayodhya (U.P.), hence the study has been purposively confined in one of its university. The particulars of the district have been furnished here has under. The district Ayodhya, is situated at 26.50°N latitude and 81.4°E longitude. Its total geographical area is 2643 square kilometer. The density of population is 1054 per square kilometer. It has five tehsils namely Faizabad, Milkipur, Bikapur, Sohaval, Rudouli and community development blooks namely Sohaval, Masodha, Purabazar, Mayabazar, Milkipur, Amaniganj, Bikapur, Tarun, Haringtonganj, Rudouli and Mawie At the second stage of sampling out of 11 communities development Blocks in Ayodhya district, the Milkipur development Block was selected purposively for this study because of the criteria that Acharya Narendra Deva University of Agriculture & technology, Kumarganj is situated in this Block.

Community development block, Milkipur was established in 1962. This is a post stage block according to block settlement. The block has been divided into six village development officer's circle for carrying out the development activities. This block has 10 Nyan panchayats namely Inayat Nagar, Dobhiyara, Gukula, Alipur khajuri, kuchera, Tendha Sari, kurawan, Sidsid and Milkipur and 67 gram panchayats and 113 villages which cover a total geographical area of 2169.45 square kilometers. The total population of the Block

*Corresponding author Email: neyazmohamadfayaz@gmail.com



P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; SP-8(3): 147-154
© 2020 IJCS
Received: 22-05-2020
Accepted: 25-06-2020

Saurabh
Ph.D. Scholar, Department of Veterinary Gynecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Sushant Srivastava
Professor, Department of Veterinary Gynecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Anand Kumar
M.V.Sc. Scholar, Department of Veterinary Gynecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Pushkar Sharma
Ph.D. Scholar, Department of Veterinary Gynecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor Assoc Dean, Department of Agri. Extension, College of Agriculture , Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

VK Singh
Professor, Animal Genetics & Breeding, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Vinay Kumar
SRF, IIPR, Kalyanpur, Kanpu, Uttar Pradesh India.

Corresponding Author:
Sushant Srivastava
Professor, Department of Veterinary Gynecology & Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, Uttar Pradesh, India

Current perceptive on canine cystic endometrial hyperplasia-pyometra syndrome-A review

Saurabh, Sushant Srivastava, Anand Kumar, Pushkar Sharma, RK Doharey, VK Singh and Vinay Kumar

DOI: https://doi.org/10.22271/chemi.2020.v8.i2c.9772

Abstract
Cystic endometrial hyperplasia-pyometra complex (CEH/P) is a life-threatening challenge in canine reproduction. Hormonal imbalances result in environmental and histological changes in the uterus leading to a predisposition to bacterial growth. Haematological analysis shows the total number of leucocytes is frequently elevated in cases of pyometra, although the degree is much less marked in cases of open cervix pyometra compared with closed cervix pyometra. Ovariohysterectomy is the treatment of choice for closed cervix or open cervix pyometra. If the condition is not life-threatening and the animal is enrolled in breeding programmed or particularly valuable or when the clinical situation precludes surgery, medical treatment may be considered.

Keywords: Uterus, cystic endometrial hyperplasia (CEH), hormones, canine pyometra, aglepristone

Introduction
During estrus cycle, the uterus of female dogs undergoes different morphological changes under the influence of progesterone and estrogen. Cystic endometrial hyperplasia is an abnormal response of non-castrated canine uterus under these ovarian hormones. Cystic endometrial hyperplasia and pyometra complex (CEH/P) represents a common life-threatening challenge in small animal reproduction (Pretzer, 2008; Melandri *et al.*, 2019) [37, 30]. Cystic endometrial hyperplasia (CEH)-pyometra syndrome is an acute or chronic, poly-systemic, diestrual disorder of non-castrated bitch characterized by hyperplasia of the endometrium and infiltration of inflammatory cells, which may be present in all layers of the uterus (Dow, 1957; Kennedy *et al.*, 1993) [9, 29]. However, during the animal's life, there is progressive hyperplasia, which ultimately results in the development of pathological lesions termed cystic endometrial hyperplasia several authors suggested that pyometra should be classified as CEH-pyometra complex because sub-acute endometritis later develops as CEH is the most important predisposing factor of pyometra (Sandholm *et al.*, 1975) [39]. Others suggest that CEH and pyometra should be classified separately based on differences in clinical and histopathological findings (Debosscher, *et al.*, 2001) [8]. It is common to see pyometra defined as the endometritis/cystic endometrial hyperplasia/pyometra complex (CEH/P) (Arora *et al.*, 2006) [3].

Pyometra can be defined as the pathological condition of uterus in which, there is an accumulation of purulent semisolid-liquid material inside the uterine lumen of intact bitches, generally during post progesterone dominant phase of the estrous cycle. Canine Pyometra can be classified based on the status of the cervix may be two types open-cervix and closed-cervix. Closed-cervix pyometra is a particularly more dangerous condition in comparison to open cervix because septicemia and toxemia may develop rapidly and left untreated can result in patient death. However closed-cervix pyometra needs surgical intervention to prevent its progression to sepsis and fatality in non-castrated bitch (Smith, 2006) [45].

Prevalence and History
Pyometra has consistently been shown to predominantly affect middle-aged to older-aged non castrated bitches, with mean age varying from 6.4 to 9.5 years (Dow, 1958; Ewald, 1961; Hardy 1974; Wheaton *et al.*, 1989; Sevelius *et al.*, 1990; Niskanen and Thrusfield, 1998; Egenvall *et al.*, 2001; Fukuda, 2001; Whitehead, 2008; Igna, 2011; Hagman *et al.*, 2011) [10, 14].

Journal of Community Mobilization and Sustainable Development Vol. 15(1), 130-134, January-April, 2020

Bottlenecks of Potato Growers and Ways to Ameliorate Them: Micro Level Study from Kannauj District of Uttar Pradesh

Ashwani Kumar Verma[1]*, R.K. Doharey[2], Sachchidanand Upadhyay[3], S.K. Dubey[4] and Kaushik Prashad[5]

[1,3]Research Scholar, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh

[2]Associate Dean, College of Agriculture, Azamgarh Campus, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

[4]Principle Scientist ICAR-ATARI, Zone III, Kanpur, Uttar Pradesh

[5]Assistant Professor, Department of Agricultural Extension, Rama University, Kanpur, Uttar Pradesh

ABSTRACT

Horticulture sector has become one of the major drivers of growth in the agriculture sector and it share about 30 per cent among total agriculture output. Potato (*Solanum tuberosum* L.) is considered to be one of the most epochal horticultural crops in the world because of its most affordable and most accessible food, which provide copious health benefits. In Uttar Pradesh, Kannauj district is an abundant producer of the potato crop. The study was conducted in Jalalabad block of Kannauj district of Uttar Pradesh. A simple random sampling method was used to select 125 respondents out of total 1338 potato growers from the selected five villages. The study reveals that according to degree of seriousness of constraints the maximum number of respondents faced constraints like, the constraint under socio-psychological was found most important constraints, *i.e.* 'skilled farm workers are hardly available'. Under economical constraints, the most important constraints *i.e.* 'costly diesel charges, and 'corruption of credit sanctions. Under technological constraints, the most important constraints were 'non-availability of quality HYV seeds. Under transportation constraints, the most important, was 'indigenous transport-means *viz.*, bullock cart, dunlop, tonga take much time and causes more inconvenience in transporting the products. Under post harvest technological constraints, the most improvement were 'lack of space in house of potato farmers for storing the products. The suggestive measures to overcome the constraints in potato production technology as perceived by the respondents were "suitable approach for the safeguard of the crop against the animal (blue calf)". Most frequently opined remedial measures expressed by the respondents and field observation made by the investigator was ensuring the fencing of the farmers' farm as appropriately as possible

Keyword: Personal interview constraint, Potato, Random sampling, Suggestive measures

INTRODUCTION

Potato (*Solanum tuberosum* L.) popularly known as 'The king of vegetables', has emerged as fourth most important food crop in India after rice, wheat and maize. Indian vegetable basket is incomplete without Potato. Because, the dry matter, edible energy and edible protein content of potato makes it nutritionally superior vegetable as well as staple food not only in our country but also throughout the world. Potato contributes about 1.23 per cent to the gross production from agricultural and allied activities in India (Prasad, 2006). Potato is a very important cash crop in India and the country produced 45.34 mt of potato from 1.99 mha land with average productivity of 22.80 tones/ha during 2012-13 (NHB, 2013).

Uttar Pradesh is the largest potato producing state in the country and accounts for 32 per cent of total production. The state produces 14.43 mt of potato from an area of 0.60 mha with productivity of 23.9 tones/ha during 2012-2013 (NHB, 2013). This rapid growth under production (10.63 mt in 2008-09 to 14.43 mt in 2012-2013) of potato in Uttar Pradesh was possible through dissemination of the latest technology under real farming conditions. Potato cultivation has become highly commercialized in Uttar Pradesh, still there is a wide gap between current production and potential productivity. So efforts have to be made by researchers, policy makers and extension workers together to overcome these constraints. With the view to achieve a high level of production it is not enough to develop farm

*Corresponding author email id: ashwanikumar761994@gmail.com

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(3): 1935-1942
Received: 25-03-2020
Accepted: 29-04-2020

Vinay Kumar
SRF Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

Ramesh Singh
Retd. Assistant Professor Department of Plant Pathology, Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

RK Doharey
Professor (Extension Education) and Associate Dean ANDUA & T Kumarganj Ayodhya, Uttar Pradesh, India

Satendra Kumar
Horticulture Directorate of Extension SVPUA&T Modipuram Meerut, Uttar Pradesh, India

Corresponding Author:
Vinay Kumar
SRF Indian Institute of Pulses Research Kanpur, Uttar Pradesh, India

Evaluation of the effect of different fungicides against *Phytophthora infestans* (Mont) de Bary *(In vitro)*

Vinay Kumar, Ramesh Singh, RK Doharey and Satendra Kumar

Abstract
Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the the most serious disease of potato. Several management practices have been adopted for so for to minimize the disease. Butin the present investigation based on Laboratory condition. The efficacy of six different fungicides tested on mycelial growth of the *Phytophthora infestans* (Mont.) de Bary that minimum radial growth with 0.75 mm in diameter was recorded at 300 ppm concentration which was followed by 200 ppm, and 100ppm and 50 ppm. However, nomycelial growth recorded at 400 ppm. As per concern of percent inhibition the highest with 100 % inhibition was recorded from 400 PPM concentration of Metalaxyl . Hence, the use of fungicides is the very effective method for management of plant disease and continuous use both systemic and even protective fungicides of fungicides may supressed growth of a develop strain of the *Phytophthora infestans* (Mont.) de Bary.

Keywords: Phytophthora, Late blight, Mycelium, Fungicides, Radial growth, ppm

Introduction
Potato (Solanumtubersom L) ranks third in importance as a food crop, following wheat and rice belonging to the family Solanaceae (Hawkes, 1989) [2]. It is considered as a good source of energy and proteins, sodium, potassium, thiamin, calcium, phosphorus, magnesium, vitamin B, folic acid and other vitamins. Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious and destructive diseases of potato all over world, including India. The great Irish famine in 1845, due to late blight is one of the most dramatic episodes caused by a plant pathogen in human history (Khurana *et al*., 1998 [3]. Worldwide losses due to late blight of potato are estimated to exceed $5 billion annually and thus the pathogen is regarded as a threat to global food security. The disease caused yield losses ranging from 31-100%.The use of fungicides is the very effective method for management of plant disease. Several management practices have been adopted for so for to minimize the disease. But in the present investigation condition use of six different fungicides tested on mycelial growth of the *Phytophthora infestans* (Mont.) de Bary. In India, late blight pathogen attacked the potato crop in severe form wherever it is grown. However, it is comparatively more devastating in Himalayan and Nilgiri hills and causes severe crop losses. In Indo-Gangetic plains, depending upon prevailing weather conditions, the early appearance of late blight of potato may seriously damage the potato crop and causing heavy loss of potato growers.

Materials and Methods
The present investigations based on Glasshouse experiment was undertaken at Department of Plant Pathology, Chandra Shekhar Azad University of Agriculture and Technology Kanpur during crop season 2016-18. The procedure and techniques applied during the course of investigations were elucidated as below:

Isolation, purification, identification and maintenance of *Phytophthora infestans* (Mont) de Bary Collection of infected plant samples
Late blight infected leaves were collected from the potato field at Vegetable Research Farm, C. S. Azad University of Agriculture and Technology, Kanpur. Infected leaves with sporulation lesions were taken from the field and washed in sterilized water. The leaves were then placed in a humidity chamber with the leaf an axial side up. They were incubated at 18±1°C in BOD. until sporulation appeared. Small pieces of infected tissue along with healthy portion from the sporulating border were cut and placed under potato slices in empty sterilized Petri-plates. The Petri-plates were incubated at 18± 1°C for 10 days until there was a growth of abundant

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; SP-8(2): 43-55
© 2020 IJCS
Received: 04-01-2020
Accepted: 06-02-2020

Vinay Kumar
IIPR Kalyanpur, Kanpur, Uttar Pradesh, India

Ramesh Singh
Department of Plant Pathology, CSAUAT, Kanpur, Uttar Pradesh, India

RK Doharey
Professor & Associate Dean, COA, Campus, Azamgarh, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Ramesh Chand
Assistant Professor, Department of Plant Pathology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Sushant Srivastava
Professor, Department of Vet Gynecology, CVSCAH, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rabindra Kumar
Assistant Professor, Department of Vet. Gynecology, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Vinay Kumar
IIPR Kalyanpur, Kanpur, Uttar Pradesh, India

Study the effect of integrated disease management approach on germination, plant height and yield of potato and on severity of late blight of potato *Phytophthora infestans* (Mont.) de Bary.

Vinay Kumar, Ramesh Singh, RK Doharey, Ramesh Chand, Sushant Srivastava and Rabindra Kumar

DOI: https://doi.org/10.22271/chemi.2020.v8.i2b.9501

Abstract
Late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious diseases of potato. Several management practices have been adopted so for to minimize the disease. But in present investigation based on laboratory and glass house condition revealed that soil application and tuber seed dressing with bioformulation provided good protection against late blight and also stimulate the germination. The data showed that the plant height of potato was maximum in treatments T1(Soil application of FYM @ 125gm/pot +mushroom waste with *T. harzianum* @ 5gm/gm+tuber treatment with *Azotobacter* @ 5%+foliar spray with Ridomil @ 0.25%) with the value of 44.9 cm at 30 days age of plant. Tuber treatment with bio agents stimulated the germination per cent of the tuber. The Maximum germination per cent was noted in case of T1(Soil application of FYM @ 125gm/pot+mushroom waste with *T. harzianum*@ 5gm/kg+tuber treatment with *Azotobacter*@5%+foliar spray with Ridomil @ 0.25%) Growth promoting effects of the soil amendment+ tuber treatment + foliar spray were also perceived. The fungicides and bio agents were found to increase the plant length over control. Foliar spray with the fungicides pathogenic inoculation protected the plants against infection resulting reduced disease severity. The minimum disease severity (10.66) was reported from treatments were given as treatment T1(Soil application of FYM 125gm/pot+ mushroom waste with *T. harzianum* 5gm/kg +tuber treatment with *Azotobacter* @5%+foliar spray Ridomil @ 0.25%) treated plants against 82.33% disease severity in case of control. The integrated effect o FYM+ mushroom waste as soil application bioformulation as tuber 51.67gm. and total weight of tuber 338.33gm. where trea tment was given as soil application of FYM @125gm/pot+ mushroom waste with *T. harzianum*@ 5gm/kg+tuber treatment with *T. harzianum* @5%+foliar spray with 665.02gm was recorded from treatment T1(Soil application of FYM 125gm/pot +mushroom waste *T. harzianum* @ 5gm/kg+tuber treatment with *Azotobacter*@ 5%+foliar spray with Ridomil @ 0.25%).

Keywords: Late blight, *Azotobacter*, mushroom waste, *Trichoderma*

Introduction
Potato can be used as a vegetable alone or in combination with other vegetables such as cabbage, cauliflower, tomato, brinjal, beans etc. It is also used in the preparation of chips, puffs and raw pulp. It is served in meals as well as snacks preparation. Thus, potato is important for small- hold farmers as well as a cash crop. The daily need of potato is increasing day by day resulting from increasing population growth of the world. Therefore, there is a demand for more production from per capital available land. Though, production of potato is increasing continuously but productivity rate per unit area of land is very low as per other countries of the world, which has the main reason of biotic factors caused by fungi, bacteria, virus, viroid and nematodes etc. Among them late blight of potato caused by *Phytophthora infestans* (Mont.) de Bary is one of the most serious and destructive diseases of potato all over world, including India. The great Irish famine in 1845, due to late blight is one of the most dramatic episodes caused by a plant pathogen in human history (Khurana *et al*., 1998) [1]. The Irish famine affected food production as well as economic and social aspect of communities (Large, 1940) [2]. The disease is also the major bottleneck in potato production in Ethiopia and other parts of the world (Goodwin *et al*. 1995) [3].

The Pharma Innovation Journal 2021; SP-10(8): 731-733

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 731-733
© 2021 TPI
www.thepharmajournal.com
Received: 09-07-2021
Accepted: 12-08-2021

Vikash Pandey
Ph.D. Research Scholar, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor and In-charge HOD, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

NR Meena
Assistant Professor, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Vikash Pandey
Ph.D. Research Scholar, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Awareness of farmers about hybrid rice production practices

Vikash Pandey, RK Doharey and NR Meena

Abstract
The present study was conducted in two districts of Eastern Uttar Pradesh. Namely district Azamgarh in Eastern Plain Zone North and Sonbhadra in Vindhyan Zone of Uttar Pradesh since there was more cultivated land. Keeping in view the highest and lowest area under hybrid rice in the block of the district. From selected blocks of Azamgarh district namely Thekma, Tarwa and Tahbarour. Separate lists of villages were prepared. From them four villages from each block will be selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. Four villages from each block were selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. From selected blocks of Sonbhadra District namely Chatra, Chopan, Duddhi. Separate lists of villages were prepared. From them four villages from each block will be selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. Four villages from each block were selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. A separate list of farmers was prepared for each selected village and arranged according to the category of farmers i.e. marginal, small, medium, and big farmers. Therefore, a total of 360 respondents were selected through random sampling techniques, 15 framers were selected from each village. The knowledge in the present context has been conceptualized as the amount of information about currently recommended practices is known to the farmers and the adoption would be operational the recommended technology is actually being utilized by the farmer on their fields. . Keeping in the view consequence of production practices of hybrid rice, the present study conducted on "Awareness of farmers about hybrid rice production practices". Present study pertaining to 2020-21. majority of farmers are aware from new production technology used in hybrid rice production 49.44 farmers having high(29and above) followed by medium (25-28) 28.33 per cent and low (up to 24) 22.22 pe cent, respectively are aware from new production technology at overall level. It also concluded that most of farmers are aware from what are the different types of hybrid rice farming.

Keywords: awareness, knowledge, random sampling technique, technology etc.

Introduction
The total agricultural exports from the country. Rice is the most essential and widely grown food crop in the world. Because of it provides national food security and generating employment and incomes for the low-income sectors of society, most of Asian governments regard hybrid rice as an intentional commodity. India was the major exporter of hybrid rice (10.14 million tones) in 2013-14 followed by Thailand, Vietnam and U. S. A. Hybrid rice occupies about 23 per cent of the gross cropped area as well as 35 per cent of the total area under food grains in the country. Hybrid rice is consider as the master crop of coastal India as well as in several regions of the eastern India during the summer monsoon rainy season mutually high temperature and heavy rainfall offers ideal circumstances for the cultivation of hybrid rice. Approximately the entire parts of India are appropriate for raising hybrid rice during the summer season. Consequently, hybrid rice is too raised even western Uttar Pradesh, Punjab and Haryana in low level areas such as waterlogged during the summer and monsoon rainy season. The need of machinery for hybrid rice cultivation arises due to drudgery, high production cost, low quality, low cropping intensity and Labor scarcity. Farm equipment are used in agricultural operations including immediate post-harvest activities with the objective of increasing the productivity of land and labor through relevance of operations, efficient use of inputs, perfection in quality of produce, safety issues and comfort to farmers, reduction in loss of produce and drudgery of farmer. Tractor mounted implements i.e. mould board ploughs, disc ploughs, cultivators and other crop- specific equipment are widely used for seed bed preparation. Seed drills and planters, both animals drawn and tractor mounted, become popular. The knowledge recognized as one of the most important component of human

The Pharma Innovation Journal 2021; SP-10(8): 739-745

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 739-745
© 2021 TPI
www.thepharmajournal.com
Received: 11-07-2021
Accepted: 14-08-2021

Shalu Gautam
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

RK Doharey
Professor at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

NR Meena
Asstt. Prof. at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Atul Kumar
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author
Shalu Gautam
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

To assess the knowledge extent of farmers which use of cell phone in Kanpur Dehat district of U.P.

Shalu Gautam, RK Doharey, NR Meena and Atul Kumar

Abstract
This study was conducted in Akbarpur, Maitha, Sarwankhera and Jhinjhak block of Kanpur Dehat district of Uttar Pradesh to know the study and importance of cell phone usages for empowerment of rural farmer's during the year 2020-21. A total number of 400 farmers were selected randomly from a list of 20 randomly selected villages. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. That the majority of the respondents (46.00) belonged to the categories of medium (25-56) for their overall knowledge about using cell phone, followed by 27.50 per cent respondents belonged from the category of low (up to 24) and only 26.50 per cent respondents belonged from the category of high (57 and above), respectively. Hence, it can be concluded that the overall knowledge level of the cell phone users about using cell phone was maximum medium category (25-56).

Keywords: knowledge, mean, standard deviation, correlation, cell phone, respondents

Introduction
A cellular phone is a telecommunication device that uses radio waves over a networked area (cells) and is served through a cell site or base station at a fixed location, enabling calls to transmit wirelessly over a wide range, to a fixed landline or via the Internet. In this networked system, the cellular phone is identified as a mobile system consisting of the equipment and SIM card that actually assigns the mobile telephone number.

A cellular phone is also known as a cell phone or mobile phone. It enables a user to communicate almost anywhere in the world. The cell phone was invented by Dr. Martin Cooper, along with his team of developers at Motorola.

The first cell phone weighed 2.4-pounds and was 9-inches long. Dr. Cooper also made the first cell phone call at Motorola on April 3, 1973.

India has 1,026.37 million active mobile users on 2G, 3G and 4G networks – in 2018, TRAI statistics report. Total mobile subscriber base including active and inactive users has reached 1,176 million in2018. The proportion of active subscribers was approximately 87.28 percent of the total wireless subscriber base.

Bharti Airtel has the maximum proportion (98.68 per cent) of its active wireless subscribers. Vodafone Idea has 93.33 percent active mobile phone customers on its network. Reliance Jio has 83.59 percent active customers on its 4G network. BSNL has 56.20 percent active mobile users in 2018.

Mobile customers in urban areas reached 647.52 million. India has 528.48 million mobile users in rural areas. Mobile phone density in India was 89.78 in 2018. Mobile service tele-density was 155.48 in urban areas and 59.15 in rural areas.

Information delivery system is the one of the main components for dissemination of knowledge or new technology. Information gap has been recognized as one of the important constraints in the overall agricultural development of the country. Indian agriculture had been on traditional lines till the first waves of green revolution in late 60s. The green revolution gave a sudden boost to the production and productivity of major cereals in the assured irrigated areas. Quick dissemination of technological information from the Agriculture Research System to the farmers in the fields and reporting farmers' feedback to the research system is one of the critical inputs in transfer of technology.

To increase the farm production, the farmers need to be informed on recent scientific farm innovations. Farm information and technology dissemination to the farmers provides opportunities for their self-development, improves existing knowledge, skills and enhances

The Pharma Innovation Journal 2021; SP-10(8): 726-730

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 726-730
© 2021 TPI
www.thepharmajournal.com
Received: 08-07-2021
Accepted: 11-08-2021

Vikash Pandey
Ph.D. Research Scholar, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor and In-Charge HOD, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

NR Meena
Assistant Professor, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Vikash Pandey
Ph.D. Research Scholar, Department of Extension Education, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Socio-economic, communication and psychological characteristics attributes of the hybrid rice growers

Vikash Pandey, RK Doharey and NR Meena

Abstract
The present study was conducted in two districts of Eastern Uttar Pradesh. Two districts *viz*. Azamgarh and Sonbhadra from Eastern regions of Uttar Pradesh were selected purposively. Therefore, three blocks *viz*. Thekma, Tarwa, Tahbarpur of Azamgarh district and Chatra, Chopan, Duddhi of Sonbhadra district were selected purposively. Separate lists of villages were prepared. From them four villages from each block will be selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. Four villages from each block were selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. Four villages from each block were selected randomly to draw the samples of farmers, with the consideration of highest acreage under hybrid rice. A separate list of farmers was prepared for each selected village and arranged according to the category of farmers i.e. marginal, small, medium, and big farmers. Therefore, a total of 360 respondents were selected through random sampling techniques, 15 framers were selected from each village. The suitable statistical tools/techniques were used for computing the data and inferences to be drawn. The present study carried out during the year 2020-2021. Hybrid rice is consider as the master crop of coastal India as well as in several regions of the eastern India during the summer monsoon rainy season mutually high temperature and heavy rainfall offers ideal circumstances for the cultivation of hybrid rice. Most of farmers are belonged to age group (35-55 years) 49.44per cent and majority of people belongs to general category. Majority of respondents educated, most of respondents have mixed house, majority of farmers depends on agriculture as a source of income, most of farmers having marginal farmers and their income falls under medium income. It also concluded that majority of respondents are belongs to nuclear family. It observed that 42.22 per cent of the respondents were participated as member of two organizations/office bearer followed by 37.77 per cent participated in one organization and 20.00 per cent respondents having No participation in any organization. Respondents were used cycle as means of transportation. Sent per cent members having cots and crockery in term of house hold material. It also evident from that sent per cent of the respondents having Kudal, kurpi found as source of agricultural material. Majority of respondents were used mobile phone 90.83 per cent for communication purpose.

Keywords: social participation, communication, statistical tools, sampling technique and respondents etc.

Introduction
Paddy (*Oryza sativa*) is one of the vital cereal crops of the world and forms the staple food for more than 50 per cent of population and is recognized as "king of cereals". The United Nations General Assembly, in a resolution confirmed the year of 2004 as the "International Year of Rice", which has tremendous significance to food security. It very eloquently upheld the need to enhance awareness about the role of rice in alleviating poverty and malnutrition. India stands first in area and second in total food production. Among the rice growing countries, India has the largest area under rice in the world (45.50 million ha) with a total production of 96.43 million tonnes during 2007-08 and it stood next only to China in the world with respect to production. Hybrid rice is consider as the master crop of coastal India as well as in several regions of the eastern India during the summer monsoon rainy season mutually high temperature and heavy rainfall offers ideal circumstances for the cultivation of hybrid rice. Approximately the entire parts of India are appropriate for raising hybrid rice during the summer season. Consequently, hybrid rice is too raised even western Uttar Pradesh, Punjab and Haryana in low level areas such as waterlogged during the summer and monsoon rainy season. Individual when he is confronted with a new situation. Rice is one such crop where is lot of scope incorporating the above said practices such as to harvest higher yields and to maintain soil productivity. Hence, in order to minimize the cost of production and maximize the productivity without affecting the environment, certain steps to be taken for rice cultivation, *viz*. integrated nutrient management, integrated pest management and water

The Pharma Innovation Journal 2021; SP-10(8): 705-708

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 705-708
© 2021 TPI
www.thepharmajournal.com
Received: 28-06-2021
Accepted: 16-08-2021

Atul Kumar
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

RK Doharey
Professor and In-Charge, Department of Extension Education, ANDUA and T, Kumarganj, Ayodhya, Uttar Pradesh, India

SN Singh
SMS Agricultural Extension, KVK Siddharthnagar, Uttar Pradesh, India

NR Meena
Assistant Professor, Department of Extension Education, ANDUA and T, Kumarganj, Ayodhya, Uttar Pradesh, India

Shalu Gautam
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

Corresponding Author
Atul Kumar
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

To assess the impact of farmers through knowledge and adoption of crop insurance scheme

Atul Kumar, RK Doharey, SN Singh, NR Meena and Shalu Gautam

Abstract
A study conducted in titled "To assess the impact of farmers through knowledge and adoption of crop insurance Scheme". State U.P. and District Hardoi were selected purposively for present study because researcher is familiar with the area. Two blocks of Hardoi District namely Harpalpur and Sandi also selected purposively, separate lists of villages were prepared. From them ten villages from each block were selected randomly to draw the samples of farmers. A separate list of farmers was prepared for each selected village and arranged according to the category of farmers i.e. marginal, small, medium, and big farmers. Therefore, a total of 200 respondents were selected through random sampling techniques, 10 framers were selected from each village. A structured schedule was developed with the help of guide for specially this study through various resources like research paper and because of locality. The schedule was contained various details like independent and dependent variables. The data was collected by personal interview. Statistical framework for analysis of data to analyze the collected information, following statistical tools and methods were used for interpreting the data. Present study pertaining to 2020-21. Result found that 39.00 percent respondents have high knowledge about crop insurance scheme whereas 38.50 percent and 22.50 percent respondents have medium level and low level of knowledge about Crop Insurance Scheme respectively. Majority of respondents were coming into high level of knowledge category. The mean score of knowledge is 23.39 and Standard deviation was 4.31 with range from minimum 14 to maximum 37.

Keywords: Knowledge, schedule, statistical framework and statistical tool etc.

Introduction
In April 1985, the Comprehensive Crop Insurance Scheme was implemented which covered all the willing states and Union Territories. It was implemented in 17 states and 2 Union Territories up to kharif, 1990. The benefits of the crop insurance were extended to nearly 1.94 million farmers and covered 3.14 million hectares. However, the scheme covered mainly large farmers but small and marginal farmers could not get benefits of the scheme. The benefit of the Comprehensive Crop Insurance Scheme was availed mainly by farmers of Gujarat, Maharashtra, Andhra Pradesh and Madhya Pradesh. Their share in the claims was nearly 90 percent of total claims paid in the country. On the other hand, states, like Bihar, Assam and northeastern states lagged behind in availing the benefits of crop insurance and their share less than 1 percent of total claims paid in the country. In the year, 1999-2000 the Government of India in co-ordination with the General Insurance Corporation of India (GIC) introduced a new scheme namely, the National Agricultural Insurance Scheme (NAIS) from rabi, 1999-2000 season. India is an agrarian country with 58 percent of the population engaged in agriculture and allied activities for their livelihood and contributing about 14.1 percent of the country's GDP. Crop production is not merely an occupation, but means of livelihood for Indian farmers. Nearly 75 percent of the total Indian population and 89 percent of total population of Bihar live in rural areas where primary occupation is crop cultivation. Jawaharlal Nehru once said that "*Everything can wait but not Agriculture*".

Agriculture which is an important sector of economy is considered widely as an industry. It faces various types of natural hazards. Insurance is an important instrument to give protections under risky activities and that plays significant role in the agricultural production decision, chemical use decision, cultivation practices and cropping pattern decisions. In the advance market economy public agencies introduced all risk crop insurance policies to give protection to the agriculture sector. But in the less developed or developing country such mechanism does not exist because the farmers have the lowest risk bearing capacity. Though in the developing country the sharecropping is an important policy to give them safeguard from risk activity but

The Pharma Innovation Journal 2021; SP-10(8): 734-738

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 734-738
© 2021 TPI
www.thepharmajournal.com
Received: 10-07-2021
Accepted: 13-08-2021

Shalu Gautam
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

RK Doharey
Professor at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

NR Meena
Assistant Professor at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Atul Kumar
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Corresponding Author
Shalu Gautam
Ph.D. Scholar at Department of Ext. Edu. ANDUAT, Kumarganj Ayodhya, Uttar Pradesh, India

Relationship between independent variables with those of dependent variables of the cell phone usages farmers in Kanpur Dehat district of U.P.

Shalu Gautam, RK Doharey, NR Meena and Atul Kumar

Abstract
This study was conducted in Akbarpur, Maitha, Sarwankhera and Jhinjhak block of Kanpur Dehat district of Uttar Pradesh to know the study and importance of cell phone usages for empowerment of rural farmer's during the year 2020-21. A total number of 400 farmers were selected randomly from a list of 20 randomly selected villages. The structured schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The analysis of data was done by using the percentage, mean, standard deviation, and correlation coefficient for drawing the inferences. The study furnish that most of the independent variables were positively correlated and highly, moderately significant with the dependent variables i.e. knowledge and empowerment.

Keywords: variables, mean, standard deviation, correlation, cell phone, respondents

Introduction

A cellular phone is a telecommunication device that uses radio waves over a networked area (cells) and is served through a cell site or base station at a fixed location, enabling calls to transmit wirelessly over a wide range, to a fixed landline or via the Internet. In this networked system, the cellular phone is identified as a mobile system consisting of the equipment and SIM card that actually assigns the mobile telephone number.

A cellular phone is also known as a cell phone or mobile phone. It enables a user to communicate almost anywhere in the world. The cell phone was invented by Dr. Martin Cooper, along with his team of developers at Motorola.

The first cell phone weighed 2.4-pounds and was 9-inches long. Dr. Cooper also made the first cell phone call at Motorola on April 3, 1973.

India has 1,026.37 million active mobile users on 2G, 3G and 4G networks – in 2018, TRAI statistics report. Total mobile subscriber base including active and inactive users has reached 1,176 million in2018. The proportion of active subscribers was approximately 87.28 percent of the total wireless subscriber base.

Bharti Airtel has the maximum proportion (98.68 per cent) of its active wireless subscribers. Vodafone Idea has 93.33 percent active mobile phone customers on its network. Reliance Jio has 83.59 percent active customers on its 4G network. BSNL has 56.20 percent active mobile users in 2018.

Mobile customers in urban areas reached 647.52 million. India has 528.48 million mobile users in rural areas. Mobile phone density in India was 89.78 in 2018. Mobile service tele-density was 155.48 in urban areas and 59.15 in rural areas.

Information delivery system is the one of the main components for dissemination of knowledge or new technology. Information gap has been recognized as one of the important constraints in the overall agricultural development of the country. Indian agriculture had been on traditional lines till the first waves of green revolution in late 60s. The green revolution gave a sudden boost to the production and productivity of major cereals in the assured irrigated areas. Quick dissemination of technological information from the Agriculture Research System to the farmers in the fields and reporting farmers' feedback to the research system is one of the critical inputs in transfer of technology.

To increase the farm production, the farmers need to be informed on recent scientific farm innovations. Farm information and technology dissemination to the farmers provides opportunities for their self-development, improves existing knowledge, skills and enhances their capability. In this connection, Information and Communication technologies (ITCs) hold lot of promise to deliver agricultural knowledge to the farmers.

The Pharma Innovation Journal 2021; SP-10(8): 587-590

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 587-590
© 2021 TPI
www.thepharmajournal.com
Received: 12-07-2021
Accepted: 10-08-2021

Anuj Tiwari
Ph.D. Scholar, Department of Extension Education, A.N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

NR Meena
Assistant Professor, Department of Extension Education, A.N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor, Department of Extension Education, A.N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Anuj Tiwari
Ph.D. Scholar, Department of Extension Education
A.N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Social traits of rice growers in eastern region of Uttar Pradesh

Anuj Tiwari, NR Meena and RK Doharey

Abstract
Rice is principal food grain of India specially in eastern Uttar Pradesh. Rice (Oryza sativa) is one of the major staple food for the major population of the world. The present investigation was conducted with the objective to know the Social traits of rice growers. Six blocks of Ayodhya, Bakabanki and Sultanpur district were selected randomly. Two hundred forty respondents were selected from these twelve villages i.e. 20 respondents from each village. The study concluded that a maximum number of the respondents (67.08 per cent) were finding in the age group *i.e.* middle (37-51 years). The maximum *i.e.* 98.75 per cent of respondents were found to be literate, while 01.25 per cent were illiterate. The majority of the respondents were married (95.41 per cent) against it, (4.58 per cent) respondents were un-married. The maximum number of respondents (79.58 per cent) were large farmers. The maximum 67.50 per cent of the respondents were observed to have agriculture as their main occupation followed by 8.75 per cent service (govt.+ private), 7.91 per cent per cent caste-based occupation, 6.66 per cent Business, 6.25 per cent agro-based enterprise, 1.66 per cent orcharding, 1.25 per cent goat sheep rearing, and 0.83 per cent dairying respectively.

Keywords: rice growers, land holding, orcharding

Introduction
Rice is world's leading staple crop, cultivated over an area of about 155 million hectares with a production of about 596 million tons of paddy. It is second to wheat, in area and production aspect. It provides about 22 per cent of the world supply of calories and 17 per cent of the proteins. Maximum area under rice is in Asia. Among the rice growing countries India has the largest area (44.8 million hectares) followed by China and Indonesia. In respect of production India ranks second with 131 million tons of paddy next to China (200 million tons of paddy). In regards to average yield per hectares Egypt ranks first followed by USA. Average rice yield of India is only 2929 kg per hectare.

Agriculture is the main source of income for families in the state. It has 11.56 million hectare of cultivated area, constituting 70 per cent of the total geographical area. The irrigated area is over 13.43 million hectare. The small and marginal farmers jointly contribute 19.46 per cent of farming household in eastern region against that of 19.11 per cent of Uttar Pradesh.

Majority of the agriculture land is used to grow major cereal crops: rice & wheat. Rice is the major crop in Uttar Pradesh and is grown in about 5.90 Mha which comprises of 13.5 per cent of total rice in India. Uttar Pradesh has favorable and suitable climate, vast areas of fertile soils, sunshine and adequate water resources. The cropping intensity is 153 per cent. The state ranks 3rd in the country in production of rice. (Source: Annual report 2017-18, Department of Agriculture, cooperation and farmer's welfare. Govt. of India)

Methodology
The research was confined to Eastern region of Uttar Pradesh since there was more rice cultivated land. For maintaining the representativeness of the data three districts from Eastern region of Uttar Pradesh surrounding the university i.e. Ayodhya, Barabanki and Sultanpur were selected purposively. Another reason for selection of these districts was the easy accessibility of the investigator to reach that area, people and officials etc. these districts have always been considered to be most climatically suitable for rice cultivation.

The total number of blocks in Ayodhya district is 11 namely, Masodha, Sohawal, Bikapur, Milkipur, Maya Bazar, Pure Bazar, Haringtonganj, Amaniganj, Tarun, Mawai and Rudauli. Out of these, two blocks namely Masodha and Bikapur were selected randomly.

The total number of blocks in Barabanki district is 16 namely, Banki, Masauli, Dewa, Harakh,

Biological Forum – An International Journal 13(2): 01-07(2021)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Review on Frontline Demonstration of KVK and its Effect on Yield, Economics, Income and Management Practices of Different Crops in India

Shesh Narain Singh[1], Manoj Kumar[2], *M. P. Gautam[3] and R. K. Doharey[4]

[1]SMS, Krishi Vigyan Kendra, Sohna, Siddharthnagar,
ANDUAT, Narendra Nagar, Ayodhya, India- 224229, (U.P.) India.
[2]Gest Faculty, Department of Extension Education,
Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India.
[3]Department of Entomology,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.) 250110, India.
[4]Professor, Department of Extension Education,
College of Agriculture, ANDUAT, Narendra Nagar, Ayodhya, (U.P.) 224229, India.

(Corresponding author: M. P. Gautam)*
(Received 12 March 2021, Accepted 25 May, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Field demonstration is the elderly concept of Front-Line Demonstration. FL developed by the Indian Council of Agriculture Research with the beginning of the Technology operation on Oilseed Crops during mid-eighties. Field demonstrations carry out close regulation of scientists of National Agriculture Research System recognized as frontline demonstrations because technologies are demonstrated in front of farmer by the scientists before being fed into the major extension method of the State Department of Agriculture. Adoption level of the beneficiaries were medium to high even as non-beneficiaries were found small level of adoption are enhanced production practice of mustard crop, proper training and extension strategies to be followed maximum adoption of mustard crop in the research area.

Keyword: Frontline Demonstration, KVK, Yield, economics, growth, management practices and India.

INTRODUCTION

The Krishi Vigyan Kendras were assigned different actions pertaining to evaluation, modification and expression of different novel technologies. This includes conduction of association of Frontline demonstration, estimation, training programmes and sophistication of different agriculture and related technologies during OFT. Extension activities and movement of Krishi Vigyan Kendras do significant movement for the farmers and useful in hole crop period. Krishi Vigyan Kendras are the base of all organizations who work for purpose of technology through refinement, evaluation and demonstration of confirmed technology under diverse "micro farming" situation in a region (Das, 2007). In the year 1991-92 Indian Government established a "Technology Mission on Pulses" to improve the pulse production and productivity through frontline demonstration. The mandate of the Krishi Vigyan Kendra (KVKs) are application of technology through refinement, demonstration and assessment of verified technologies under different "micro farming" situations in a region (Das, 2007).

Frontline demonstrations is show recently released crop protection and production technology and its running practice on the farmers field under diverse farming situation and agro-climatic regions. While demonstrating the technologies on farmer's field, the scientist are compulsory to study situation, factors and elements involving in higher crop production, Limitation of production and thereby create production data and feedback information. Frontline demonstrations were conduct in two adopted villages at pasture of 20 farmers within area of 0.4 hectare each. Moong crop was grown according to the package and practices of moong crop according field demonstration (Anonymous, 2017).

A. Additional activities to be conducted by KVKs

1. Field day
2. Kisan Mela
3. Kisan Gosthi
4. TV/Radio talk
5. Film Show
6. Farmers visit to KVKs
7. Diagnostic and Exposure Visits
8. Trainee and Ex-trainee meet
9. Commemoration of important day
10. Animal Health Camp
11. Trade fair
12. Kisan Mobile Sandesh

The Pharma Innovation Journal 2021; SP-10(8): 705-708

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(8): 705-708
© 2021 TPI
www.thepharmajournal.com
Received: 28-06-2021
Accepted: 16-08-2021

Atul Kumar
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

RK Doharey
Professor and In-Charge, Department of Extension Education, ANDUA and T, Kumarganj, Ayodhya, Uttar Pradesh, India

SN Singh
SMS Agricultural Extension, KVK Siddharthnagar, Uttar Pradesh, India

NR Meena
Assistant Professor, Department of Extension Education, ANDUA and T, Kumarganj, Ayodhya, Uttar Pradesh, India

Shalu Gautam
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

Corresponding Author
Atul Kumar
PhD Research Scholar, Department of Extension Education, ANDUA and T, Kumarganj, Uttar Pradesh, India

To assess the impact of farmers through knowledge and adoption of crop insurance scheme

Atul Kumar, RK Doharey, SN Singh, NR Meena and Shalu Gautam

Abstract
A study conducted in titled "To assess the impact of farmers through knowledge and adoption of crop insurance Scheme". State U.P. and District Hardoi were selected purposively for present study because researcher is familiar with the area. Two blocks of Hardoi District namely Harpalpur and Sandi also selected purposively, separate lists of villages were prepared. From them ten villages from each block were selected randomly to draw the samples of farmers. A separate list of farmers was prepared for each selected village and arranged according to the category of farmers i.e. marginal, small, medium, and big farmers. Therefore, a total of 200 respondents were selected through random sampling techniques, 10 framers were selected from each village. A structured schedule was developed with the help of guide for specially this study through various resources like research paper and because of locality. The schedule was contained various details like independent and dependent variables. The data was collected by personal interview. Statistical framework for analysis of data to analyze the collected information, following statistical tools and methods were used for interpreting the data. Present study pertaining to 2020-21. Result found that 39.00 percent respondents have high knowledge about crop insurance scheme whereas 38.50 percent and 22.50 percent respondents have medium level and low level of knowledge about Crop Insurance Scheme respectively. Majority of respondents were coming into high level of knowledge category. The mean score of knowledge is 23.39 and Standard deviation was 4.31 with range from minimum 14 to maximum 37.

Keywords: Knowledge, schedule, statistical framework and statistical tool etc.

Introduction
In April 1985, the Comprehensive Crop Insurance Scheme was implemented which covered all the willing states and Union Territories. It was implemented in 17 states and 2 Union Territories up to kharif, 1990. The benefits of the crop insurance were extended to nearly 1.94 million farmers and covered 3.14 million hectares. However, the scheme covered mainly large farmers but small and marginal farmers could not get benefits of the scheme. The benefit of the Comprehensive Crop Insurance Scheme was availed mainly by farmers of Gujarat, Maharashtra, Andhra Pradesh and Madhya Pradesh. Their share in the claims was nearly 90 percent of total claims paid in the country. On the other hand, states, like Bihar, Assam and northeastern states lagged behind in availing the benefits of crop insurance and their share less than 1 percent of total claims paid in the country. In the year, 1999-2000 the Government of India in co-ordination with the General Insurance Corporation of India (GIC) introduced a new scheme namely, the National Agricultural Insurance Scheme (NAIS) from rabi, 1999-2000 season. India is an agrarian country with 58 percent of the population engaged in agriculture and allied activities for their livelihood and contributing about 14.1 percent of the country's GDP. Crop production is not merely an occupation, but means of livelihood for Indian farmers. Nearly 75 percent of the total Indian population and 89 percent of total population of Bihar live in rural areas where primary occupation is crop cultivation. Jawaharlal Nehru once said that "*Everything can wait but not Agriculture*".

Agriculture which is an important sector of economy is considered widely as an industry. It faces various types of natural hazards. Insurance is an important instrument to give protections under risky activities and that plays significant role in the agricultural production decision, chemical use decision, cultivation practices and cropping pattern decisions. In the advance market economy public agencies introduced all risk crop insurance policies to give protection to the agriculture sector. But in the less developed or developing country such mechanism does not exist because the farmers have the lowest risk bearing capacity. Though in the developing country the sharecropping is an important policy to give them safeguard from risk activity but

Indian Journal of Agricultural Sciences **92** (2): 236–9, February 2022/Article

Determinants of behavioural indicators of potato (*Solanum tuberosum*) growers in Kannauj district of Uttar Pradesh

ASHWANI KUMAR VERMA[1], R K DOHAREY[2], S K DUBEY[3]*, O P SINGH[4] and S N SINGH[2]

ICAR-Agricultural Technology Application Research Institute, Kanpur Uttar Pradesh 208 002, India

Received: 07 July 2020; Accepted: 31 August 2021

ABSTRACT

The present study was carried out to find out the factors that may affect the behavioural dimensions of potato farmers, viz. their knowledge and adoption level as well as their knowledge-adoption gap about scientific potato cultivation practices in Kannauj district of Uttar Pradesh during 2016–17. Multiple regression and stepwise regression analysis was done with selected independent variables to see the effect of independent variables on the selected indicators. The analysed data showed that at knowledge level out of 18 variables taken for analysis of regression, four variables, viz. housing pattern, occupation, material possession and formal extension contact were highly significant (P<0.01); five variables, viz. education, housing pattern, informal extension contact, scientific orientation and risk orientation were highly significant (P<0.01) for their adoption level; and at knowledge-adoption gap one variable i.e. education was highly significant (P<0.01). The R^2 value and F value of knowledge, adoption and knowledge adoption level were 0.59, 0.29, 0.33 and 8.63, 2.52 and 2.95 (P<0.01), respectively. The R^2 value of stepwise regression in knowledge, adoption and knowledge-adoption gap level was 0.54, 0.24 and 0.24.

Keywords: Adoption, Knowledge, Multiple regression, Potato

Potato (*Solanum tuberosum* L.) belongs to family Solanaceae, is well known as the king of vegetables and has emerged as the most important food crop of India. Despite higher retail price of potato, the sowing of tuber is set to shrink in Northern states as farmers prefer alternate crops including onion, garlic, sugarcane and other perishables during *rabi*. Introduction of potato crop is not only important for ensuring socio-economic upliftment of the local farmers but for warranting financial sustainability of crop husbandry also (Rana *et al.* 2017). In last few years, the gap between wholesale and retail price of potato has widened by two-three times. It has disappointed potato growers and many are shifting to other crops. Mostly big farmers who store their produce have incurred losses in potato business and many such farmers are shifting from cultivation of tuber. In the last three years, glut in potato production has caused unrest among farmers in North. The annual output has grown to 53 million tonnes (MT) in 2018–19 compared to 51 million tonnes in 2017–18 (Krar 2019). The increase in area of potato cultivation has squeezed margins for growers as well as traders in the region.

[1]C.S.A. University, Kanpur, Uttar Pradesh; [2]N D University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh; [3]ICAR-ATARI, Zone III, Kanpur; [4]ICAR-Indian Agricultural Research Institute, New Delhi. *Corresponding author email: skumar710@gmail.com

Uttar Pradesh is a major potato growing state in India followed by West Bengal and Bihar with the production of 10455.30, 7482.30 and 1720.20 thousand tonnes, respectively. It produced almost 13.1 MT of potato, thus contributing nearly 28.6% of total potato production in the country (Directorate of Economics and Statistics 2016). Kannauj district is the highest producer of potato followed by Farrukhabad and Agra with production of 9.43, 8.33 and 6.47 lakh metric tonnes with area being 34.6, 29.8 and 18.20 thousand hectares, respectively (Anonymous 2001–02). Therefore, considering the significance of potato in Kannauj district, the study was carried out to analyse the profile of potato farmers of the district and to identify the determinants which may affect their behavioural dimensions in terms of their level of knowledge, adoption and knowledge-adoption gap.

MATERIALS AND METHODS

The present study was carried out in Kannauj district of Uttar Pradesh during 2016–17, which was selected purposively due to its high grown area under potato crop. It is considered to be the most climatically suitable area for potato cultivation. Jalalabad block of Kannauj district with maximum area under potato cultivation was further selected purposively. Five villages, viz. Paraspur, Gadnapur, Mirpur, Purva, and Bisundhua were selected randomly and from each village, 25 farmers actively involved in cultivating potato were further selected randomly.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(6): 502-505
Received: 15-09-2020
Accepted: 21-10-2020

Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Prakash Singh
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Doharey
Professor, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

RK Singh
SMS/Scientist, Department of Agricultural Extension, Mahayogi Gorakhnath Krishi Vigyan Kendra, Chaukmafi, Peppeganj, Gorakhpur, Uttar Pradesh, India

Rishi Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Abhay Kumar Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Vikash Pandey
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Arvind Pratap Singh
Research Scholar, Department of Extension Education, College of Agriculture, ANDUAT, Narendra Nagar, Kumarganj, Ayodhya, Uttar Pradesh, India

Factors influencing adoption level of farmers regarding organic farming in eastern UP

Arvind Pratap Singh, Prakash Singh, RK Doharey, RK Singh, Rishi Kumar Singh, Abhay Kumar Singh and Vikash Pandey

Abstract
This study was undertaken in three districts selected randomly from each Zone namely (1) North Eastern Plains Zone (2) Eastern Plains Zone (3) Vindhyan Zone in Eastern Uttar Pradesh. From each selected district, two blocks were selected randomly. Thereafter two villages from each block was selected randomly, thus make a total 12 villages. The majority of respondents were of middle aged and literate including formal and informal education. Highest number of the respondents (55.83%) was observed in the medium category (33 to 44) of materials possession. Majority of farmers (60.41%) had medium level of overall extent of awareness about organic farming practices. The variables like age, family size, material possession and economic motivation, were found positively correlated but not significant with adoption level regarding organic farming practices. The variables like education, caste, family type, housing pattern, land holding, occupation, income, social participation, extension contact, value orientation, risk orientation and attitude were found negatively correlated but not significant with adoption level regarding organic farming practices.

Keywords: block, proportionate, age, education, overall materials possession, organic farming practices, adoption, correlations etc

Introduction
The organic movement in India has its origin in the work of Howard who formulated and conceptualized most of the views which were later accepted by those people who became active in this movement. Organic farming is a production system which avoids, or largely excludes, the use of synthetic fertilizers, pesticides, growth regulators, and livestock feed additives.

The Indian government has initiated various promotional activities, such as setting up a National Institute of Organic Farming in Ghaziabad, Uttar Pradesh, in 2003, appointment of accreditation and certifying agencies for organic farm products, developing norms for certifying organic products and providing financial support to implement promotional activities for organic farming. The task force constituted by the Government of India has also recommended the initiation of post-graduate level courses in organic farming. One of steering committee constituted by Central Government under the chairmanship of Mr. M.S. Swaminathan, Chairman, farmer's commission, has suggested taking up organic farming as a challenging national task and to take up this as a trust area of the 10th Five Year Plan. The Ministry of Commerce launched the National Organic Program in April, 2002 and processed food products export.

"Organic farming is a production system that avoids or largely excludes the use of synthetically compounded fertilizer, pesticides, growth regulators and livestock feed additives. Organic farming systems rely to the maximum extent on crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, and aspects of biological pest control to maintain soil productivity and tilt, to support plant nutrients and control insects, weeds and other pests". (Kanel, 2005) [2].

Methodology
The present study was conducted in six blocks of three districts namely Barabanki Basti, and Prayagraj of Uttar Pradesh. Each district selected two block and find out the different independent variables and their level of adoption of organic farming practices in organic farming. Those blocks namely Masauli, bani kodar, Haraiya, Vikram jot, Phulpur and Dhanupur was selected randomly having production area of agriculture.

Hence, the present study has been designed to explore the level of adoption of organic farming practices in Barabanki, Basti, and Prayagraj districts of Uttar Pradesh with specific objective.

Biological Forum – An International Journal 13(2): 01-07(2021)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Review on Frontline Demonstration of KVK and its Effect on Yield, Economics, Income and Management Practices of Different Crops in India

Shesh Narain Singh[1], Manoj Kumar[2], *M. P. Gautam[3] and R. K. Doharey[4]

[1]SMS, Krishi Vigyan Kendra, Sohna, Siddharthnagar,
ANDUAT, Narendra Nagar, Ayodhya, India- 224229, (U.P.) India.
[2]Gest Faculty, Department of Extension Education,
Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India.
[3]Department of Entomology,
Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, (U.P.) 250110, India.
[4]Professor, Department of Extension Education,
College of Agriculture, ANDUAT, Narendra Nagar, Ayodhya, (U.P.) 224229, India.

(Corresponding author: M. P. Gautam)*
(Received 12 March 2021, Accepted 25 May, 2021)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Field demonstration is the elderly concept of Front-Line Demonstration. FL developed by the Indian Council of Agriculture Research with the beginning of the Technology operation on Oilseed Crops during mid-eighties. Field demonstrations carry out close regulation of scientists of National Agriculture Research System recognized as frontline demonstrations because technologies are demonstrated in front of farmer by the scientists before being fed into the major extension method of the State Department of Agriculture. Adoption level of the beneficiaries were medium to high even as non-beneficiaries were found small level of adoption are enhanced production practice of mustard crop, proper training and extension strategies to be followed maximum adoption of mustard crop in the research area.

Keyword: Frontline Demonstration, KVK, Yield, economics, growth, management practices and India.

INTRODUCTION

The Krishi Vigyan Kendras were assigned different actions pertaining to evaluation, modification and expression of different novel technologies. This includes conduction of association of Frontline demonstration, estimation, training programmes and sophistication of different agriculture and related technologies during OFT. Extension activities and movement of Krishi Vigyan Kendras do significant movement for the farmers and useful in hole crop period. Krishi Vigyan Kendras are the base of all organizations who work for purpose of technology through refinement, evaluation and demonstration of confirmed technology under diverse "micro farming" situation in a region (Das, 2007). In the year 1991-92 Indian Government established a "Technology Mission on Pulses" to improve the pulse production and productivity through frontline demonstration. The mandate of the Krishi Vigyan Kendra (KVKs) are application of technology through refinement, demonstration and assessment of verified technologies under different "micro farming" situations in a region (Das, 2007).

Frontline demonstrations is show recently released crop protection and production technology and its running practice on the farmers field under diverse farming situation and agro-climatic regions. While demonstrating the technologies on farmer's field, the scientist are compulsory to study situation, factors and elements involving in higher crop production, Limitation of production and thereby create production data and feedback information. Frontline demonstrations were conduct in two adopted villages at pasture of 20 farmers within area of 0.4 hectare each. Moong crop was grown according to the package and practices of moong crop according field demonstration (Anonymous, 2017).

A. Additional activities to be conducted by KVKs

1. Field day
2. Kisan Mela
3. Kisan Gosthi
4. TV/Radio talk
5. Film Show
6. Farmers visit to KVKs
7. Diagnostic and Exposure Visits
8. Trainee and Ex-trainee meet
9. Commemoration of important day
10. Animal Health Camp
11. Trade fair
12. Kisan Mobile Sandesh

Journal of Natural Resource and Development 17 (1) 134-143, 2022 | NAAS RATING : 3.77 | ISSN-0974-5033

INTEGRATED FARMING SYSTEM : A PROMISE TO SUSTAINABLE AGRICULTURE

J.ID-J385

[1]Rishi Kumar Singh, [1]R.K. Doharey, [2]Kamal Kumar, [1]Arvind Pratap Singh and [3]Adesh Kumar Verma

[1]A. N. D. University of Agriculture & Technology, Kumarganj, Ayodhya, (U.P.), India

[2]Indian Veterinary Research Institute, Izatnagar

[3]Kulbhaskar Ashram P G College, Prayagraj 211 002,(U.P.), India

E-mail : vetadesh87@gmail.com

Received : 30.07.2021 Accepted : 02.08.2021

ABSTRACT

India is an agrarian nation with 65.97 percent population belongs to rural area. The majority of the peasants in India are small and marginal, possessing less than two hectares of land. Integrated Farming System (IFS) witnessed fast development in the recent two decades when harvest and animal yields expanded, together with the worries about their financial and biophysical tradeoffs. It is basic to create procedures that empower satisfactory pay and business age, particularly for little and minimal ranchers who comprise more than 85 % of the cultivating community. Therefore, Integrated Farming frameworks can be demonstrated as reasonable methodology speaks to a suitable blend of homestead undertakings, viz. crop creation, agriculture, domestic animals, fishery, ranger service, poultry and goat in an explicit cultivating circumstance to address the issues of practical financial development of Indian cultivating communities. An integrated Farming system appears to be the conceivable answer for the nonstop increment of interest for nourishment and sustenance, salary solidness, and job upliftment, especially for little ranchers with limited resources.

Keywords: Integrated farming system, livestock, crop, apiculture, sericulture, sustainability.

INTRODUCTION

Farming has consistently been considered the inspiration of our nation. In India, 70 you look after the agricultural populace is occupied with horticulture and 80% of the populace live, legitimately or during a detour on salary conveyed from agribusiness. There are 115 million operational possessions within the nation and around 80 you're peripheral and small ranchers (Manjunatha*et al.*, 2014). To satisfy the elemental needs of the household including nourishment (oat, beats, oilseeds, milk, organic product, nectar, meat, so forth.), feed, grub, fiber, and then forth warrant a consideration about Integrated Farming System. Without a doubt, the larger a part of the ranchers is doing cultivating for a protracted back yet their

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF INSECT POLLINATORS ON SEED YIELD ATTRIBUTING PARAMETERS OF PIGEON PEA CROP

R.K.Verma,RVSingh, Umesh Chandra,Ramveer,M.P.Gautam
Department of Entomology
N.D. University of Agriculture and Technology Kumarganj, Faizabad

Abstract

The present investigation entitled "Effect of insect pollinators on seed yield attributing parameters of pigeon pea crop" at Farm of Main Experiment Station of N.D.U.A.T, Kumarganj, Faizabad during *kharif* 2014-15. The result revealed that the maximum pod setting 171 pod/plant and 90.43 per cent seed setting were recorded in open-pollination followed by bee-pollination with 161 pod/plant and minimum pod setting 124.53 pod/plant and 76.96 per cent seed setting in self-pollination. The highest seed yield 19.60 q/ha which was 40.30% increased over on self-pollination was observed in Open-pollination followed by 18.33 q/ha seed yield in Bee-pollination and minimum in self-pollinated pollination with 13.97 q/ha.

Key word: pollinators, seed, pod , insect, flowers and pigeon pea,

Introduction

Predominantly pigeon pea flowers are self-fertilized with 20-40% cross-fertilization so it is known as often cross-pollinated crop. *Cajanus cajan* flowers have bright corollae and produce nectar and pollen. These traits suggest that *C. cajan* would be attractive and possibly bee pollinated by bees (Grewal et al., 1990; Saxena et al., 1990; Reddy et al., 2004 and Sarah et al.2010).

Globally, yields of insect-pollinated crops are often managed for greater pollination through the addition of honey bees (*Apis mellifera* L.) as an agricultural input. Therefore, the potential impact of wild pollinator decline on crop yields is largely unknown. Nor is it known whether increasing application of honey bees compensates for losses of wild pollinators. The effects of evenness on pollination services remain largely unknown, and the impact of wild insect loss on fruit set has not been evaluated globally for insect-pollinated crops.

Materials and Methods

Pigeon pea variety (Narendra Arhar -1) was sown in *kharif* 2014-15 season in the month of June (30-06-2015) and crop was harvested on 25-4-2016 at Main Experiment Station of Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad. All the recommended agronomical practices were adapted to get a good crop in the field.

1. The pigeon pea (Narendra Arhar-1) harvested for sampling and recording the observations of the experiment. The following Seed yield attributing characters were worked out viz.;

(a) Number of pods per plant
(b) Per cent seed setting = No. of developed seed in pod ÷ No. of locals in pod × 100
(c) Weight of grain per plot ($6m^2$) and ha^{-1}.

Results and Discussion

Number of pods

The significant effect of insect pollinators on the pod formation was observed between different treatments. The highest pod formation 171.26 pods /plant was recorded in treatment T_2 (Open-pollination) which was higher as compared to pod formation in treatment T_3 (Bee-pollination) with 161.43 pods /plant and 124.53 pods /plant in treatment T_1 (Self-pollination.

The significantly maximum pod setting, 171pod/plant was recorded in open-pollination followed by 161 pod/plant in bee- pollination and minimum pod set 124 pods/plant was recorded from self-pollination. Pando et al. (2011) recorded *Chalicodoma cincta cincta* foraging resulted to a significant increase of the fruiting rate by 19.65%, as well as the number of pod/plant by 24.33%. Singh et al. (2013) recorded significantly positive effect of bee pollination on reproductive parameters in open pollinated plants i.e. pod setting, number of seeds and seed weight increased by 35.71, 39.14 and 32.88 per cent in cross-pollinated (unbagged) plant in comparison to self-pollinated (bagged) plant. Anonymous (2014-15) also found maximum pods setting in open- pollinated crop followed by bee-pollination and self-pollination.

2. Per cent seed setting:

A glance of data depicted in Table 1 revealed that there was significant effect of insect pollinators on the seed setting of pigeonpea crop between treatments. The maximum seed setting 90.43 per cent was recorded in treatment T_2 (Open pollination) which was significantly higher as compared to seed setting in treatment T_3 (Bee pollination) which was 87.52 per cent and 76.96 per cent in treatment T_1 (Self-pollination).

The significantly maximum seed setting, 90.43 per cent was recorded in open-pollination followed by 87.52 per cent in bee-pollination and minimum seed set 76.96 per cent was recorded from self-pollination. Fohouo et al. (2014) recorded the foraging activity of *X. olivacea* resulted in a significant increase in the Fruit by 22.26%, as well as the number of seeds/pod by 34.98% Placing *X. olivacea* nests close to *C. cajan* fields is recommended to increase seed setting in Cameroon. Rathi and Sihag (1993) recorded plots caged with *C. lanata* showed increases in seed numbers and weight compared with open-pollinated crops. Values for plots caged without bees were significantly reduced. Mazi et al. (2014) reported the fruiting rate, the number of seeds per fruit and the percentage of normal seeds of unprotected flowers in *C.cajan* were significantly higher than those of flowers protected from insects.

3. Average seed yield in q /ha:

The significant effect of insect pollinators on the seed yield was observed between treatments. The highest seed yield 19.60 q/ha was observed in treatment T_2 (Open-pollination) followed by 18.33 q/ha seed yield in treatment T_3 (Bee-pollination) and 13.97 q/ha in treatment T_1 (Self-pollination).

The significant effect of insect pollination on the seed yield was observed between treatments. The highest seed yield 19.60 q/ha was observed in treatment T_2 (Open-pollination) followed by 18.33 q/ha seed yield in treatment T_3 (Bee-pollination) and 13.97 q/ha in treatment T_1 (Self-pollination). This result is in close agreement with Brar et al. (1992) recorded pods/plant and seed yields were similar on plots caged with *A. mellifera* and those caged without bees, but pods/plant and seed yields values were 3 and 4 times greater, respectively, on open-pollinated plots. Anonymous (2014-15) also found maximum yield in open- pollination followed by bee-pollination and self-pollination.

Table-1 Effect of Insect Pollination on seed yield attributing parameters of pigeonpea crop

Treatment	Mean of Seed Yield attributing parameter				Increase over on SP in per cent
	No. of Pod per plant	Seed setting per cent	Kg/plot (6 m^2)	q/ha	
Self-Pollination (SP)	124.53	76.96	0.83	13.97	-
Open-Pollination (OP)	171.26	90.43	1.17	19.60	40.30
Bee-Pollination (BP)	161.43	87.52	1.09	18.33	31.20

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 599-601
Received: 10-05-2019
Accepted: 12-06-2019

RK Yadav
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

U Chandra
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ram Veer
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Amit Raj
Department of Entomology, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

CPN Gautam
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sachin Kumar
Department of Entomology, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Gajendra Singh
Department of Entomology, C. V. B. P. University of Agriculture and Technology, Meerut, Uttar Pradesh, India

Correspondence
RK Yadav
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Relative efficacy of newer insecticides against gram pod borer, *Helicoverpa armigera*

RK Yadav, U Chandra, Ram Veer, Amit Raj, CPN Gautam, Sachin Kumar and Gajendra Singh

Abstract
The experiment was conducted at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during Rabi season 2015-16. Studied on Emamectin benzoate 5 SG @ 11 g a.i./ha was found most effective insecticide (94.44%) to reduce the larval population, it was followed by flubendiamide 480 SC @ 30 g a.i./ha that gave 87.78 per cent reduction, which was at par with rynaxypyr 20SC @ 40 g a.i./ha (83.33%). Least effective treatment was Lufenuron 50EC @ 60 g a.i./ha. in which only 64.44 percent reduction in larval population was registered. Reduction in larval population computed from data recorded 14 days after spraying revealed that all the treatments were effective and significantly superior to control. Emamectin benzoate 5 SG @ 11 g a.i.//ha was found most effective that reduced 100.00 per cent larval population.
Emamectin benzoate 5 SG @ 11 g a.i.//ha treated plots gave maximum grain yield (18.00 q/ha), it was at par with flubendiamide 480 SC @ 30 a.i./ha and Rynaxypyr 20SC @ 40 g a.i./ha in which 17.00, 16.50 q/ha grain yield, respectively were recorded. Maximum cost- benefit ratio was obtained in plot treated with flubendiamide 480 SC @ 30 g a.i./ha (1:10.06) followed by emamectin benzoate 5 SG @ 11 g a.i.//ha (1:9.20). Lowest cost -benefit ratio (1:3.10) was found in Lufenuron 50 EC@ 60 g a.i./ha treated plot.

Keywords: Pod borer, management, cost benefit, treatments and insecticides

Introduction
Chickpea, *Cicer arietinum* L. belongs to family Papilionaceate is an important pulse crop grown in many parts of the world. It is an important source of protein in human diet and animal feed (Khoso, 1992) [2]. The split grain of chickpea is called dal which is an excellent source of high quality proteins, essential amino and fatty acids, fibres, minerals and vitamins.
The area under chickpea cultivation in India is about 9.51 m ha with production of 8.83 m tonnes and productivity 929 kg/ ha. The area under U.P. is 0.0604 m ha with production of about 0.0732 m tonnes with an average yield of 1212 kg/ha (Anonymous, 2013-14) [1].
The chickpea pod borer, *Helicoverpa armigera* is polyphagous in nature which causes damage to several crops such as pigeon-pea, groundnut, cotton, vegetables, pearl millets, sorghum, maize, sunflower etc.
The young larvae often feed upon the tender foliage before attacking the pods by causing heavy losses to crop and sometimes whole crop failed due to severe infestation (Lohar and Rahoo, 1993; Nizamani, 1998) [3, 4]. Damage potential of this pest is so great that an average infestation of single larva may destroy 30-40 pods per plant in chickpea. The extent of losses in chickpea by pod borer varies from region to region. On chickpea, the pest appears in late February and reaches its peak by the end of April. Since not much resistance is available in gram genotype against the pest, therefore, farmers are increasingly relying on synthetic insecticides to manage this pest on different crops.
The pest feeds voraciously from seedling stage to maturity and causes about 50 to 60 per cent damage to the chickpea pods (Khare and Ujagir, 1977) [5]. In India, losses caused by pod borer on chickpea and pigeon pea fields exceeded Rs. 12,000 million per year (Anonymous, 1996) [6].
To control this insect pest number of chemical insecticides is used injudiciously which resulted development of resistance in insect, secondary pest outbreaks, threat to their natural enemies and residual effect on environment. In order to develop pest management strategies of *H. armigera*, knowledge on the basic biology of this pest is required. Jadhav and Suryawanshi, (1998) [7] reported that the application of insecticides reduced the larval population of pod borer on chickpea crop to a considerable extent and hence increased the yield. Balasubramanian *et al* (2001) [8] reported that chlorpyrifos 20 EC was the most effective insecticide to control gram pod borer.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 784-786
© 2019 JEZS
Received: 16-09-2019
Accepted: 18-10-2019

Sachin Kumar
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Yadav
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Jyoti
Department of Seed Science and Technology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vinod Kumar
Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture& Technology, Meerut, Uttar Pradesh, India

Corresponding Author:
Sachin Kumar
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Population dynamics of pigeonpea pod fly (*Melanagromyza obtusa*) and their correlation with abiotic factors in pigeonpea

Sachin Kumar, Umesh Chandra, SK Yadav, Jyoti and Vinod Kumar

Abstract
The present investigations entitled "Population dynamics of pigeonpea pod fly (*Melanagromyza obtusa*) and their correlation with abiotic factors in Pigeonpea" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2017. The pest activity started with the initiation of pod formation and continued though at varying level, throughout the reproductive stage of the crop. The presence of maggots of *M. obtusa* was noticed for the first time in 5th standard week. The maximum maggot population (37 maggots /100 pods) were recorded during 9th SW and the highest pupal population of (21pupae /100 pods) were recorded in 12th SW. It is evident from data that during 2017-18, maggots population showed non-significant negative correlation with minimum temperature (-0.261) and maximum temperature (-0.243) while relative humidity showed non-significant positive correlation (0.529) and pupal population had non-significant positive correlation with minimum temperature (0.195) and maximum temperature (0.389) while relative humidity showed non-significant negative correlation (-0.196).

Keywords: Population dynamics, pigeonpea pod fly, *Melanagromyza obtusa*, correlation, abiotic factor and pigeonpea

1. Introduction

Pigeonpea [*Cajanus cajan* (L.) Millsp.] is also known as red gram or arhar or tur in vernacular, the most important delicious pulse of the entire country. After gram, pigeonpea is the second most important pulse crop of India, which contributes about 90 per cent of the world's pigeonpea production. Area under pigeonpea in India is about 53.87 lakh hectare with an annual production of 45.99 lakh tons and productivity of 854 kg/ha. Pod fly being an internal feeder, both the maggot and pupal stages are present inside the pods. The white maggots feed on the developing seed and pupate inside the pod. The pod fly infested pods do not show any external symptom of damage until the fully grown larvae chew the pod wall leaving a thin papery membrane intact known as window through which adults exit the pods and thus it becomes hard to manage the pest in time. Pod fly, *Melanagromyza obtusa* (Malloch) is a key pest of pigeonpea (*Cajanus cajan*) throughout South-east Asia. It attacks the crop from pod filling to pod maturity. The oviposition of pod fly takes place on the inner surface of the pod walls. Females deposit the eggs singly under the epidermis in the green pods and the larvae after hatching mines into the pods and feeds on the soft seed thus making it unfit for human consumption as well as seed purposes (Lal and Yadav, 1993) [7]. Pulse are important components of over daily dietary requirements as they are cheapest sources of protein, vitamin, energy and minerals, production of pulse increase at a much slower rate compare to cereal, oil seeds and other crops over the two decades. Just like other crops, include of red gram in cropping pattern repair soil health and soil fertility. It plays an important role in human diet and also improving soil fertility through the biological nitrogen fixation. Arhar is one of the most important pulse crop, to be cultivated in 25 countries of the world on 5.8 million ha with 4.4 million tons of production, whereas in Asia it is grown in 5.07 million ha and producing 3.07 million tons in 2011 (FAO, 2013) [4]. Pigeonpea is a most important *Kharif* pulse crop grown in India. Area under pigeonpea in India is about 53.87 lakh hectare with an annual production of 45.99 lakh tons and productivity of 854 kg/ha (Anonymous, 2017) [1]. Pod fly incidence was started from the second week of January (2.0 to 2.8%) and continues till harvest, with a peak of 15.6 per cent in the first and 13.7 per cent in the second year during the third week of January and the incidence showed significant negative correlation with the

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

POPULATION DYNAMICS OF INSECT – PESTS IN SUGARCANE CROP

Shivshankar Singh[1], Umesh Chandra[2] Roopesh Singh[3] Sanjay Singh[4], Sarvesh singh[5]and Abhishek Kumar Chaudhary[6]
1,2,3,6 Department of Entomology, 4 Department of Plant Pathology and
5 Department of Horticulture
NDUA&T, Kumarganj, Faizabad-224229, UP, India.

Abstract
The survey of population dynamics of insect – pests in sugarcane crop with special reference to early shoot borer and top borer carried out during spring season at farmer's field in eastern U.P. Present investigation revealed that five insect- pests prevailed and infested sugarcane crop in these areas. They were shoot borers (*Chilo infuscatellus*), top borer (*Scirpophaga excerptalis*), leaf hopper (*Pyrilla perpusilla*), termites (*Odentotermes obesus*) and grass hopper (*Hieroglyphus spp.*). The maximum infestation (32.22%) of shoot borer was recorded on 20th Standerd week and the minimum infestation (3.33%) on 13th and 28th SW. The highest termite infestation (38.88%) was noticed on 20th SW, whereas the lowest (1.11%) on 12th and 28th SW. The maximum population (4.47 insects/plant) of grass hoppers was noticed from 31th SW and the minimum population (0.13 insects/ plant) on 42nd SW in the field. Sugarcane top borer caused maximum infestation (35.55%) on 32nd SW and minimum (1.11%) on 41st SW.
Keywords- Shoot borer, Top borer, infestation, leaf hoppers

Introduction

Sugarcane (*Saccharum officinarum* L.) is one of the major sugar-producing crop that contributes nearly 75 per cent to the total sugar pool at global level. It belongs to genus Saccharum and family Poacae. Molasses is an important by- product of sugar industry. It is used for production alcohol by the distilleries. India ranks first in sugarcane production in the world followed by Brazil. The area, production and productivity of sugarcane in India were 5.47 mha, 380 mt and 69.4 t/ha, respectively. Whereas in Uttar Pradesh, sugarcane is grown in about 2.28 mha area with 121.36 mt annual production and 53.23 t/ha productivity (Anonymous 2012).

Among the various constraints in sugarcane production, varieties, fertilizers, irrigation, insect- pests and the disease are prime importance. As many as 200 species of insect- pests have been reported on sugarcane crop (Jaipal and Singh, 2010), however, one dozen are recognized as major pests at various stages of crop growth. The shoot borer, Chilo infuscatellus Snellen and top borer, Scirpophaga excerptalis Walker are more serious pests in the early stage of the crop throughout the country. In Punjab, Haryana and northern Rajasthan the stalk borer, Chilo auricillius Dudgeon is raised as an important pest in recent years (Atwal and Dhaliwal, 2007).

Shoot borer has been reported as serious pest of sugarcane in which the early shoot borer, *Chilo infuscatellus* caused 30 to 75 per cent losses in early stage of the crop in sub-tropical region (Jaipal et al. 2010). The young larvae bore down the spindles by moving upward direction and destroyed the apical meristem. Consequently, the cut off spindle dries up and develops a conspicuous 'dead heart' that can be pulled out easily and emits rancid odour.

Top borer, *Scirpophaga excerptalis* has been considered as the most serious pest of sugarcane which caused 31.94% loss in early and 28.50% loss in mid to late maturing cultivars. It attacks the upper parts of the sugarcane plant. The caterpillars bore into the midrib of leaves and enter into the top portion of the plants (Madan and Singh, 2002).

Materials and Methods

Population dynamics of insect- pests:

Farmer fields were selected to record the population dynamics, Sugarcane crop was regularly monitored in the morning hours at weekly intervals to observe the population/infestation of various insect- pests from germination to harvest on 10 randomly selected plants at three locations in each in all the fields.

A. Borers:

i. **Shoot borers-**

Number of healthy and infested plant at shoot stage of the cane was recorded by observing the dead hearts and puncture holes on leaf sheath.

ii. **Top borer-**

The observations on incidence of top borer was recorded by observing the dead hearts, shoot holes, mined midrib leaves as well as bunchy top on sugarcane clumps.

B. **Root feeders**:

i. Termites-

Number of infested and healthy crop plants.

C. Sap Feedres:

i. Grass hopper-

Number of both nymphs and adults on the infested leaves.

ii. Leaf hopper-

Number of both nymphs and adults on upper, middle and lower leaves

Results and Discussion

Only five insects- pests were noticed on sugarcane crop during spring, season *viz.*, shoot borers (*Chilo infuscatellus*), termites (*Odentotermus obesus*), top borer (*Scirpophaga excerptalis*), leaf hopper (*Pyrilla perpusilla*) and grasshopper (*Hieroglyphus spp.*) at different growth stages of the crop.

The initiation of shoot borers infestation was noticed on 13th SW (3.33%) and continued up to the 27th SW. The maximum infestation (33.33%) was recorded on 20th SW, and minimum (3.33%) at 27th SW. The initiation of termite infestation was noticed on 13th SW (6.6%) and continued up to the 27th SW. The maximum infestation (43.33%) was recorded on 20th SW and minimum (3.33%) at 27th SW.

Initiation of top borer infestation was started on sugarcane in 25th SW and which was continued up to 41th SW, the maximum infestation (33.33%) was recorded on 32nd SW and minimum (3.33%) at 25th and 40th SW. Grasshopper population was noticed on 13th SW (0.30 insects/plant) and continued up to the 42nd SW. The maximum population (4.60 insects/plant) was noticed on 31th SW and minimum (0.20 insects/plant) at 42th SW.

Initiation of leaf hopper population was noticed on 22nd SW (0.40 insects/plant) and continued up to 41st SW. The maximum population (4.20 insects/plant) was recorded on 35th SW and minimum (0.30 insects/plant) at 41st SW. The results are in conformity with Madan and Chaudhary (1995) observations, who had noticed the population of leaf hopper from January to December with (25.5 insects/plant) highest population in the month September, while lowest (0.1 insects/plant) in March.

References

Abdullah, M. (2009). Incidence of some major insect- pest to sugarcane clones in Bangladesh. *Indian sugar*, 59 (6): 17-26

Anonymous (2012). The Sugar Technology Association of India, pp. 1-3.

Atwal, A.S. and Dhaliwal, G.S. (2007). Agricultural pests of South Asia and their management. Kalyani Publishers, Ludhiyana, New Delhi, India, pp. 1-305.

Jaipal, S. and Singh, J. (2010). Integrated insect pest management for low external input sugarcane production. In Producing of the 9th Joint Convention of STAT SISSTA: 109-125.

Jaipal, S. and Singh, D. (2003). Bio- efficacy of imidacloprid and amrutguard against termites and shoot borer in sugarcane crop. *Indian sugar*, 53 (9): 709-716.

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

ABUNDANCE AND QUANTIFICATION OF THE POLLINATORS IN PIGEON PEA

R. K.Verma,RVSingh, Umesh Chandra,Ramveer,Gajendra Singh,C.P.N.Gautam
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Faizabad

Abstract

The present investigation entitled "Abundance and Quantification of the pollinators in pigeon pea [*Cajanus cajan* (L.) Millsp.] through insect pollinators" at Farm of Main Experiment Station of N.D.U.A.T, Kumarganj, Faizabad during *kharif* 2014-15. The result revealed that the a number of insect pollinator *Apis dorsata, Apis mellifera and Trigona irridipennis* of honey bee species, house fly, butter fly, syrphid flies and moths were observed on pigeon pea flowers during the observation period i.e., 21 February to 2 March of the year, 2015. The insects of order-hymenoptera namely; *Apis dorsata, Apis mellifera, T. irridipennis* were the major floral visitors belonging to family Apidae. The insects among this apidae family, *Apis dorsata* and *A. mellifera* were the most frequent visitors. The abundance of insect pollinators were found maximum in afternoon (3.00-4.00 PM) with 44.9 pollinators /plant /5 min. The higher number of floral visitors in the evening can be attributed of favourable meteorological parameters of afternoon. However, *A. dorsata* showed its maximum visit on inflorescence in forenoon in respect to other pollinators.

Key word: pollinators, visitors, insect, pigeon pea, and flowers.

Introduction

Pigeon pea [*Cajanus cajan* (L.) Millsp], is a short-lived perennial crop of family Fabaceae and it is invariably cultivated as annual and often cross-pollinated (20-70%) crop. Pigeon pea is one of the major grain legume crops grown in the tropics and subtropics (Saxena et al., 2002). Most of the evidence points to India as the place where pigeon pea originated because of the presence of several wild relatives, the large diversity of the crop gene pool, ample linguistic evidence, a few archaeological remains and the wide usage in daily cuisine (Van der Maesen. 1990). *Cajanus cajan* offers many benefits to subsistence farmers as a food and cash crop and also ensures stable crop yields in times of drought (Nene and Sheila 1990).

Cajanus cajan flowers have bright corollae and produce nectar and pollen. These traits suggest that *C. cajan* would be attractive and possibly bee pollinated by bees (Grewal et al., 1990; Saxena et al., 1990; Reddy et al., 2004 and Sarah et al.2010).

Globally, yields of insect-pollinated crops are often managed for greater pollination through the addition of honey bees (*Apis mellifera* L.) as an agricultural input. Therefore, the potential impact of wild pollinator decline on crop yields is largely unknown. Nor is it known whether increasing application of honey bees compensates for losses of wild pollinators. The effects of evenness on pollination services remain largely unknown, and the impact of wild insect loss on fruit set has not been evaluated globally for insect-pollinated crops.

Materials and Methods

The field works of experiment was carried out at farm of Main Experiment Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) on the Faizabad Road at the distance of 42 km away from Faizabad district.

Quantification of Pollinators:

1.The visit of different pollinators and their number on flowers were recorded on randomly selected 10 plants for 5 minutes each in forenoon (9-10 AM) and afternoon (3-4 PM) for 10 days in open-pollination crop (OP).

2.Weather parameters also recorded particularly temperature, humidity, rainfalls and sunshine hour during observations of pollinators visit and their correlation with pollinators.

Results and Discussion

Pollinators' diversity on pigeon pea:

To quantify the insect pollinators, the regular visual observations of pollinators' number were recorded on inflorescence in open-pollinated plots (OP) of the Pigeonpea crop during flowering period (21 February to 2 March, 2015) at the Main Experiment Station, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad and presented in the Table-1. Several insect pollinators were found during observation period. The pollinators visited on the pigeonpea flowers were belonging to the orders Diptera, Hymenoptera and Lepidoptera. Among them the house fly (order: Diptera) were most dominating pollinators besides, honey bee (Hymenoptera).

Table-1: Diversity of insect pollinators on pigeonpea crop during blooming period at MES, Kumarganj, Faizabad, during 2015.

S. No.	Common name	Scientific name	Order	Family
1	Rock bee	*Apis dorsata* Fab.	Hymenoptera	Apidae
2	Italian bee	*Apis mellifera* L.	Hymenoptera	Apidae
3	Dammer bee	*Trigona iridipennis*	Hymenoptera	Apidae
4	House fly	*Musca domestica*	Diptera	Muscidae
5	Syrphid flies	Unidentify	Diptera	Syrphidae
6	Butterflies	Unidentify	Lepidoptera	-
7	Moths	Unidentify	Lepidoptera	-

Table-2: Quantification of different insect pollinators during flowering stage on Pigeonpea (NDA-1) crop

Days	Date	The average number of pollinators per plant/5 min.													
		Fore-noon 9-10 AM							After-noon (3.00-4.00 PM)						
		A.d	A.m	T. I	House fly	Syrphid fly	Others	Total	A.d	A. m	T. I	House fly	Syrphid fly	Others	Total
1	21/2/15	12	20	2	5	1	1	41	14	21	4	7	2	1	49
2	22/2/15	13	22	3	8	1	1	47	15	18	4	6	3	2	48
3	23/2/15	21	13	1	6	2	0	54	23	26	7	5	2	1	64
4	24/2/15	24	20	1	7	2	0	60	29	25	8	6	4	1	73
5.	25/2/15	16	8	4	6	5	1	39	14	16	8	7	4	0	49

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(3): 22-24
© 2018 JEZS
Received: 05-03-2018
Accepted: 06-04-2018

Satya Narayan Satapathy
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Satya Narayan Satapathy
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of bee pollination, *Apis mellifera* L. on yield and quality parameters of Bael (*Aegle marmelos* Correa)

Satya Narayan Satapathy and Umesh Chandra

Abstract
The present experiment was conducted to mensurate the pollination effect of *Apis mellifera* L. on yield attributing characters i.e. fruits per panicle, its weight and TSS percentage of cultivar "Narendra Bael 9" at Main Experiment Station, Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. The trees were laden with floral buds/panicles within 7-10 days of emergence of new leaves and reached in full bloom during the months of May-June when days were long and temperature was high. Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators. The treatment applied were pollination by honey bee only, natural pollination with augmentation of honey bees, natural pollination and control (no pollination). Maximum average number of fruit panicle^{-1}, average fruit weight and average TSS percentage were 27.3, 2.05 kg and 41.3% in natural pollination with augmentation of honey bees while minimum 1.3, 1.8 kg and 35.7% were observed in control. Similarly an increase of 2000.00%, 8.46% and 15.68% over control and 47.56%, 6.22% and 5.08% over natural pollination was observed in average number of fruit panicle^{-1}, average fruit weight and average TSS percentage under the treatment natural pollination with augmentation of honey bees.

Keywords: Pollination, *Apis mellifera*, Bael fruit panicle^{-1}, fruit weight, TSS percentage

1. Introduction
Pollination is defined as the transfer of pollens from male portion of a flower to the female portion which is essential for the process of fertilization and production of fruits and/or seeds [1]. About 90% pollination is carried out by insects, 85% of which comprises the honeybees [2]. The nature and extent of pollination can vary between crops, ranging from increasing the quality and quantity of fruits or seeds and increase genetic diversity within crop species [3]. Inadequate pollination can result not only in reduced yield but also in delayed yield and a high percentage of inferior fruits [4]. The insects of family Apidae are the most reliable agents for pollination. Among members of Apidae family, honey bees are particularly important pollinators as they are capable of carrying pollens with which they feed their immature stages, and in the process, the plants visited by them are benefited [5]. Bees are active when flowers are most receptive. Collection of pollens by bees usually ends before noon but nectar collection continuous into late afternoon. Bees visit the fruit producing flowers more often than the male blossoms and stay on them longer [6].
Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators like honeybees, hover fly, yellow wasp, carpenter bee, weevil, black ants, butterflies etc. [7] Emergence of new leaves commenced during the 2nd and 4th week of May and continued till July. The transfer of pollen requires some agents and animal pollinators such as honeybee, *Apis mellifera* L. play an important role for carried out the pollination process [3]. The present study was planned to determine the effect of pollinators including honeybee (*Apis mellifera* L.) on yield and quality parameter of bael.

2. Materials and Methods
The present study was carried out under saline sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 metres from mean sea level] during 2014. A randomized block design (RBD) with four treatments and six replications was applied.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 1784-1787
Received: 22-07-2018
Accepted: 07-09-2018

Rohit Chauhan
Department of Entomology and Agril. Zoology, Banaras Hindu University, Varanasi, Uttar Pradesh, India

AK Singh
Department of Entomology, NDUA&T Kumar Ganj, Faizabad, Uttar Pradesh, India

Kamal Ravi Sharma
Department of Entomology and Agril. Zoology, Banaras Hindu University, Varanasi, Uttar Pradesh, India

Amjad Ali
Department of Entomology, NDUA&T Kumar Ganj, Faizabad, Uttar Pradesh, India

Correspondence
Rohit Chauhan
Department of Entomology and Agril. Zoology, Banaras Hindu University, Varanasi, Uttar Pradesh, India

Screening of mungbean (*Vigna radiata* L.) germplasm against major sucking pest

Rohit Chauhan, AK Singh, Kamal Ravi Sharma and Amjad Ali

Abstract
A field experiment was conducted to screening the mungbean germplasm against sucking pests. The data revealed that the population of whitefly ranged from 3.66 to 23.30/cage. The maximum white fly population was recorded in genotype RMG-1092 (23.30 white fly/cage) followed by AKM 12-14 and GAM-5(13.66 whitefly/cage) and minimum (3.66 whitefly/cage) in genotype MDGVV-16. However, the population of jassid was ranged between 7.33 to 30.00/cage. The maximum jassid population was recorded in genotype VGG 10-008 (30.00 jassid/cage), followed by COGG-912 (28.00 jassid/cage) and minimum (7.33 jassid/cage) in genotype PUSA-1672. The population of thrips ranged from 3.80 to 8.80 per five plants. The maximum population of thrips was recorded in genotype IGKM 06-26-5(8.80 thrips/5 plants) followed by NKM 15-12 (8.70 thrips/5 plants). While the minimum population of thrips was observed in NBPGR-150 (3.80 thrips/5 plants).

Keywords: Mungbean, germplams, white fly, jassid, thrips.

Introduction

Pulses, the food legumes, have been grown by farmers since millennia providing nutritionally balanced food to the people of India [1] and many other countries in the world. *Vigna radiata* (L.) Wilczek [Synonyms: *Phaseolus radiatus* L. (1753), *Phaseolus aureus* Roxb. (1832)], often known as green gram/mungbean, is native to India and central Asia. It has been grown in these regions since prehistoric times [2] and as an important legume crop in India throughout the year. It is short day plant. An annual rainfall of 600-700 cm is sufficient for crop growth. Optimum temperature requirement is 28-30 ^{0}C. It is cultivated on a wide range of soils from sandy loams to black cotton soil. Optimum pH of soil for green gram is 6.5-7.5. It can tolerate soil salinity to some extent. Mungbean is third most important pulse crop of India after chickpea and pigeon pea. It is relished for easy digestibility as dal or split seeds and green pods are used as vegetables. The seeds are said to be a traditional source of cures for paralysis, rheumatism, coughs, fevers and liver ailments [3] Being an important short-duration *Kharif* grain legume, mungbean is grown extensively in major tropical and sub-tropical countries of the world. It is cultivated in India, Myanmar, Pakistan, Thailand, Sri Lanka, Indo-China, Indonesia and China. In India, it is cultivated in Andhra Pradesh, Orissa, Madhya Pradesh, Maharashtra, Bihar and Gujarat. In India, the area under mungbean was 3.83 mha. with production 1.60 million tonnes and productivity 418 kg/ha. In Uttar Pradesh, the area under mungbean was 51000 ha. with production 33000 tonnes and productivity 666 kg/ha [4].

It has been reported that sixteen species of insect-pests cause damage to mungbean *viz.*, legume pod borer (*Maruca vitrata*), gram pod borer (*Helicoverpa armigera*), white fly (*Bemisia tabaci*), jassid (*Amrasca biguttula biguttula*), thrips (*Megalurothrips distalis*), bihar hairy caterpillar (*Spilarctia obliqua*), tobacco caterpillar (*Spodoptera litura*), and stem fly (*Ophiomyia phaseoli*) [5]. Among sucking pests, whitefly *Bemisia tabaci* (Aleyrodidae: Homoptera) is a serious pest. Both nymphs and adults suck the sap from under surface of leaves which result in chlorotic spots and also pre-maturely dropping of leaves. It also leads to development of souty mould on leaves that interfere with photosynthetic activity [6]. It also acts as a vector of Mungbean Yellow Mosaic Virus (MYMV). Jassid, *Amrasca biguttula biguttula* (Cicadellidae: Homoptera) is an alarming pest throughout the crop growth. Nymphs and adults of jassid desap the leaves which results in a characteristic symptom known as "hopper burn". Thrips are small, slender insects that are less than 2 mm long. Pest status is moderate, widespread and regular. Crops are at greatest risk during flowering and pod set. Nymphs and adults feed on growing points and inside the flowers which can result in flower abortion and pod distortion.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(4): 1679-1681
© 2018 JEZS
Received: 15-05-2018
Accepted: 16-06-2018

Gajendra Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

SK Yadav
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

SK Giri
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Kuldeep Verma
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Gajendra Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Studies on correlation between populations of major insect-pests with abiotic factors

Gajendra Singh, AK Singh, SK Yadav, SK Giri and Kuldeep Verma

Abstract
The present investigation was conducted to study the occurrence of major insect-pests of Indian mustard (*Brassica juncea* L.) during Rabi, 2016-2017 at major insect-pests from germination to pre-harvest stage of the crop at three farmers 'fields. In the village Pithla, Shivnathpur and Jorium of Narendra University of Agriculture and Technology, Kumarganj Faizabad total of five insects namely mustard sawfly, mustard aphid, painted bug, cabbage butterfly and Coccinellids was found associated with mustard crop of these first were found as pests and the Coccinellids as the predator of aphids. The aphid population build up significant negative correlation with minimum temperature (-0.469*) and non-significant negative correlation with maximum temperature (-0.283) and sunshine hours (-0.098) while it showed significant positive correlation (0.079*) with RH.

Keywords: Indian mustard, correlation coefficient, insect-pests with weather parameters

Introduction
Oilseeds crop play an important role in agriculture economy of India. Constitutes the second largest agriculture product in the country next after food grains 47.80 lakh in country Area under mustard cultivation in India as 36.15million ha with production of 71.09 mt. Rapeseed-mustard oil production increased from1.94 million MT from 2014-15 to 2.11 million MT in 2015-16 European Union is expected to be top producer followed by China & Canada tonnes and the national productivity (Anonymous, 2016) [1].

Indian mustard is a major winter (*Rabi*) season oilseed crop grown mainly in Northern parts of India. Farmers generally start sowing during late October which continues till late November In Uttar Pradesh the crop was grown on 0.82 m ha with production of 0.90 MT and productivity of 1262 kg/ha (FAO, 2015) [5].

The crop starts flowering in the months of December to January and harvesting season start mainly from mid- February to April month. Mustard seed is the third biggest source of vegetable oil in the world after soybean oil and palm oil. It is the second largest source of protein meal in the world after soybean meal. Oil content in rapeseed & mustard varies from 33% to 46% and average oil recovery is around 32% to 38%. After oil extraction, the remaining part of the seed is used to produce rapeseed/mustard meal an important component of cattle and poultry feed. Being a winter crop, it requires a temperate climate to prosper.

A dozen of insect-pests have been found associated with the crop out of which mustard sawfly, mustard aphid are the important pests of rapeseed- mustard (Bakhetia and Sachan 1997, Bakhetia and Sekhon 1989) [2, 3]. The incidences of insect-pests cause lower production and productivity of mustard due to direct and indirect damage. The present study was under taken to the know association the different association of different insect population. To record the correlation between populations of major insect-pests with abiotic factors.

Materials and Methods
The mustard crop was regularly monitored for occurrence of major insect-pests from germination to pre-harvest stage of the crop at three farmers 'fields- In the village Pithla, Jorium and Shivnathpur. The occurrence of insect-pests was recorded on ten randomly selected from each field from weekly interval and are presented in (Table-1). The mode of observations for different insect-pests and natural enemies has been given below.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3377-3381

EXCELLENT PUBLISHERS

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 3377-3381
Journal homepage: http://www.ijcmas.com

Original Research Article

Population Dynamics and Management against Budfly *Dasyneura lini* Barnes in Linseed (*Linum usitatissimum* Linn.)

Mohammad Rizwan[2*], Umesh Chandra[1], Rajat Deshwal[2], Mohammad Imran[3], Gajendra Singh[2] and Ankush Kumar[2]

[1]Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India
[2]Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110, Uttar Pradesh, India
[3]Department of Genetics and Plant Breeding, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110, Uttar Pradesh, India
**Corresponding author*

A B S T R A C T

The population dynamics of budfly *Dasyneura lini* was experimented during rabi season 2012-13 at the Student's Instructional Farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.). The incidence of budfly was recorded on variety Neelum at weekly intervals from germination till the harvest of the crop. There were eight treatments, namely Imidacloprid 17.8 SL @ 0.005%, Nimbicidine 0.25%, NSKE 5%, Neem leaf extract 5%, Green chilli extract 0.5%, Garlic extract 5%, Tulsi leaf extract 5% and Control. While application of Imidacloprid (17.8 SL @ 0.005 %) was found most effective followed by Nimbicidine @ 0.25 %, NSKE @ 5 % was found as the least effective in controlling of bud fly infestation. On the basis of yield, the highest yield was obtained from Imidacloprid 17.8 SL @ 0.005 % (16.22 q ha^{-1}) followed by (14.29 q/ha^{-1}) with Nimbicidine @ 0.25 %. On the basis of overall performance of all the eight treatments Imidacloprid was isolated as the most effective treatment for the control of the linseed budfly.

Keywords

Linseed budfly, population dynamics, Imidacloprid

Introduction

Linseed, (*Linum usitatissimum* Linn.) is one of the oldest oilseed crop known as poor man's crop in India. It has got special importance amongst oilseed crop in rabi and has also been called as 'Alsi', 'Tisi', 'Mosina' and 'Arise' in India. Among all the insect of linseed, budfly is the most important insect and it affect the pods of linseed very drastically leads to reduce the crop yield. The crop is cultivated commercially for flax in the world. In India, Linseed is globally cultivated for oil production, fibers and flax. Fibres are used for the manufacture of linen and the stem yields fibres of good quality having high strength and beauty. It is utilized in making the best quality hand kerchiefs, materials of suits and dresses, bedding, napery, hand towels and other decorative articles (Gill, 1987). Every part of the linseed is utilized commercially either directly or after processing. About 80 per cent of the oil goes

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 1061-1065
© 2019 JEZS
Received: 19-11-2018
Accepted: 23-12-2018

Avinash Udikeri
Department of Entomology, College of Agriculture, Faizabad Narendra Deva of University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Faizabad Narendra Deva of University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

orrespondence
vinash Udikeri
epartment of Entomology,
ollege of Agriculture, Faizabad
arendra Deva of University of
griculture and Technology,
umarganj, Faizabad, Uttar
radesh, India

Pollination efficiency of different insects on Phalsa *Grewia subinaequalis* D.C

Avinash Udikeri and Umesh Chandra

Abstract
A field experiment was conducted to evaluate efficiency of different pollinators on Phalsa, *Grewia subinaequalis* D.C. a fruiting shrub at Faizabad (U.P) during 2015. The foraging activity started from April month. *Apis dorsata* found to visit more number of flowers (10.01) in a minute by spending very less time (2.27 sec) per flower.*A. mellifera, Halictus sp., Polistes olivaceus* and *Megachile sp.* found visiting 9.35, 6.27, 4.16 and 3.92 number of flowers in a minute and spent 2.82,6.55,7.89,7.31 seconds on flower respectively. *A. dorsata* appeared to be most efficient pollinator on Phalsa with pollination index of 85066 followed by *Apis mellifera.* Highest fruit setting (59.17%) was recorded in the bee pollinated plants followed by open pollinated plants under Kumarganj agro-ecological conditions.

Keywords: bees, foraging rate, pollination index, phalsa

1. Introduction
Phalsa *Grewia subinaequalis* D.C (Order malvales and family Tiliaceae) an indigenous to India and it is mentioned in vedic books. Shrub is known with different names in East and North India. Phalsa was grown naturally at low elevations in dry zone of island of Luzon. Area of Phalsa is very less in the present world, It is only cultivated for research purpose in some places like former Federal Experiment Station, Mayaguez, Puerto Rico, and the Agricultural Research and Education Center, Homestead, Florida (Morton 1987) [10]. It was introduced into Phillipines in 1914 from India and Presently it is cultivated commercially mainly in the Punjab and around Mumbai. Apart from India it is cultivated in Pakistan, Nepal, Bangladesh, Laos, Sri Lanka, Thailand, Philippines, Vietnam and experimental basis in some provinces of United States of America. It bears very hardy fruit, hence can be planted on marginal soils, where rest of the fruits crops cannot be grown. Its cultivation is more popular in peri-urban vicinity. Phalsa fruit is liked for its acidic taste, coloured squash, syrup and medicinal astringent, stomachic values. It decreases inflammation when unripe fruit is eaten and is also administered in respiratory, cardiac and blood disorders, as well as in fever. An infusion of the bark is given as a demulcent, febrifuge and treatment for diarrhea. The root bark is employed in treating rheumatism. The leaves are known to have antibiotic action. It attracts many insects as flower visitors and reported to be pollinated by them Singh *et al.* (2018) [12].
The present studies has been conducted using the various factors such as foraging rate, loose pollen grains sticking to the body, pollination index and fruit set percentage in order to learn about the pollination efficacy of different insects which has not been assessed so far in Phalsa. A better understanding of entomophily may help in better maintenance of Phalsa shrubs and to have better yields.

2. Materials and Methods
The experiments were carried in a well established two years old Phalsa plantation (cv. Dwarf variety) at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) Geographically, it is situated at 26.47^{0}N latitude, 82.12^{0}E longitude and altitude of 113 meters above mean sea level. The site is located in typical saline-alkaline belt of indo gangetic plains of eastern Uttar Pradesh. The experiment site was having sodic soils. The experiment was conducted in randomized block design. The number of plants selected for observation was ten. The number of treatments were 5 which were replicated 5 number of times.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(3): 22-24
© 2018 JEZS
Received: 05-03-2018
Accepted: 06-04-2018

Satya Narayan Satapathy
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Umesh Chandra
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Correspondence
Satya Narayan Satapathy
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Effect of bee pollination, *Apis mellifera* L. on yield and quality parameters of Bael (*Aegle marmelos* Correa)

Satya Narayan Satapathy and Umesh Chandra

Abstract
The present experiment was conducted to mensurate the pollination effect of *Apis mellifera* L. on yield attributing characters i.e. fruits per panicle, its weight and TSS percentage of cultivar "Narendra Bael 9" at Main Experiment Station, Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. The trees were laden with floral buds/panicles within 7-10 days of emergence of new leaves and reached in full bloom during the months of May-June when days were long and temperature was high. Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators. The treatment applied were pollination by honey bee only, natural pollination with augmentation of honey bees, natural pollination and control (no pollination). Maximum average number of fruit panicle^{-1}, average fruit weight and average TSS percentage were 27.3, 2.05 kg and 41.3% in natural pollination with augmentation of honey bees while minimum 1.3, 1.8 kg and 35.7% were observed in control. Similarly an increase of 2000.00%, 8.46% and 15.68% over control and 47.56%, 6.22% and 5.08% over natural pollination was observed in average number of fruit panicle^{-1}, average fruit weight and average TSS percentage under the treatment natural pollination with augmentation of honey bees.

Keywords: Pollination, *Apis mellifera*, Bael fruit panicle^{-1}, fruit weight, TSS percentage

1. Introduction
Pollination is defined as the transfer of pollens from male portion of a flower to the female portion which is essential for the process of fertilization and production of fruits and/or seeds [1]. About 90% pollination is carried out by insects, 85% of which comprises the honeybees [2]. The nature and extent of pollination can vary between crops, ranging from increasing the quality and quantity of fruits or seeds and increase genetic diversity within crop species [3]. Inadequate pollination can result not only in reduced yield but also in delayed yield and a high percentage of inferior fruits [4]. The insects of family Apidae are the most reliable agents for pollination. Among members of Apidae family, honey bees are particularly important pollinators as they are capable of carrying pollens with which they feed their immature stages, and in the process, the plants visited by them are benefited [5]. Bees are active when flowers are most receptive. Collection of pollens by bees usually ends before noon but nectar collection continuous into late afternoon. Bees visit the fruit producing flowers more often than the male blossoms and stay on them longer [6].
Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators like honeybees, hover fly, yellow wasp, carpenter bee, weevil, black ants, butterflies etc. [7] Emergence of new leaves commenced during the 2nd and 4th week of May and continued till July. The transfer of pollen requires some agents and animal pollinators such as honeybee, *Apis mellifera* L. play an important role for carried out the pollination process [3]. The present study was planned to determine the effect of pollinators including honeybee (*Apis mellifera* L.) on yield and quality parameter of bael.

2. Materials and Methods
The present study was carried out under saline sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 metres from mean sea level] during 2014. A randomized block design (RBD) with four treatments and six replications was applied.

Journal of Entomology and Zoology Studies 2018; 6(2): 2563-2567

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

JEZS Journal of Entomology and Zoology Studies

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(2): 2563-2567
© 2018 JEZS
Received: 12-01-2018
Accepted: 15-02-2018

SK Giri
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

Gajendra Singh
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

MP Gautam
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

Ramesh Jaiswal
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

Correspondence
SK Giri
Department of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, Uttar Pradesh, India

Study the abundance of insect pollinators/visitors in rapeseed-mustard (*Brassica juncea* L.)

SK Giri, Umesh Chandra, Gajendra Singh, MP Gautam and Ramesh Jaiswal

Abstract
The present investigation entitled "Impact of honey bee (*Apis mellifera* L.) pollination in mustard (*Brassica campestris* var. *toria*) to the enhancement of seed yield" in randomized block design was recorded at Student Instructional Farm of N.D.U.A.T, Kumarganj, Faizabad during *Rabi* 2016-17. The result revealed that the insects of order-Hymenoptera namely; *Apis dorsata, Apis mellifera, T. irridipennis* were the major floral visitors belonging to family Apidae. The insects among this apidae family, *Apis dorsata* and *A. mellifera* were the most frequent visitors. The abundance of insect pollinators was found maximum in afternoon (3.00-4.00 PM) with 31.56 pollinators /plant/5 min. The higher number of floral visitors in the evening can be attributed of favorable meteorological parameters of afternoon. However, *A. dorsata* showed its maximum visit on flowers in afternoon with respect to other pollinators. The maximum pod setting 76.24 pod/plant and 83.50 percent s eed setting were recorded in open-pollination followed by bee-pollination with 71.20 pod/plant and 78.25 percent seed setting and minimum pod setting 69.12 pod/plant and 71.80 percent seed setting in self-pollination.

Keywords: Abundance, pollinators, visitors, rapeseed-mustard, *Brassica juncea. Apis dorsata, Apis mellifera and Trigona irridipennis*

1. Introduction
India is one of the largest rapeseed-mustard growing country in the world occupying the third position in the area and in production after China and Canada with 12% of the worlds total production. *Brassica juncea* is the second most important oilseed crop in the country after groundnut and accounts for nearly 30.7% of the total oilseed production in the country. At global level rapeseed-mustard is cultivated on 36.15 m ha with production of 71.09 mt. Rapeseed-mustard oil production increased from 1.94 million MT from 2014-15 to 2.11 million MT in 2015-16. European Union (EU) is expected to be the top producer followed by China and Canada in 2015-16. India may be the fourth largest producer. India's share in global production of mustard oil in 2015-16 may be around 9.0 percent. The US and China were the leading importing countries of mustard oil in the world. India was the 7th largest importing country in 2013-14. (Anonymous 2015) [5].

Indian mustard [*Brassica juncea* L. Czern & Coss.], which is cultivated throughout the world belongs to the family *Cruciferae* (*Brassicaceae*) under the genus Brassica, cultivated all over India and it is the major *rabi* oilseed crop of northern India. It has 38 to 42% oil & 24% protein. Honeybees provide pollination services to several cultivated and wild species, thereby, maintaining biological diversity. Bee poisoning or killing of bees from pesticides continues to be a serious problem for beekeepers. Most bee kill occurs when pesticides are applied or allowed to drift on to flowering crops or weeds. Most (99%) bee kills result from bees picking up the pesticides when foraging. The hazards of insecticidal application on flowering crops include direct mortality, fumigative effects, repellent effects and toxicity of the residues present on various floral parts and in nectar (Pal *et al*.-2015) [6].

2. Materials and Methods
An extensive research work was conducted in order to collect the information pertaining to different aspects of the present investigation entitled "Impact of honey bee (*Apis mellifera*) pollination in mustard (*Brassica campastris* var. *toria*) to enhancement of seed yield". The investigation was carried out during *Rabi*, 2016-17 at Student Instructional Farm, Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad (U.P.) India.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 612-618

EXCELLENT PUBLISHERS

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 612-618
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Efficacy of Botanicals against *Helicoverpa armigera* (Hubner) on Chickpea (*Cicer arietinum* L.)

M. P. Gautam[1*], Umesh Chandra[2], S. N. Singh[1], S. K. Yadav[1] and S. K. Giri[1]

[1]Department of Entomology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224229 (UP), India
[2]S.M.S. (Agril. Extension), KVK, Masodha, Faizabad-224133 (U.P.), India
**Corresponding author*

Keywords

Gram, chickpea, botanicals, *Helicoverpa armigera*, insecticide, management, etc.

A B S T R A C T

The present investigations entitled "Studies on population dynamics of *Helicoverpa armigera* (Hubner) on chickpea" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi,* 2016.All the treatments were found significantly superior over control, indoxacrb (14.5 SC) performed best among the treatments followed by Neem oil. The effectiveness of treatment determined in the terms of grain yield of chickpea obtained in different treatments revealed that the Indoxacarb @ 14.5SC, Neem seed oil @ 5ml and karanj oil @ 5ml were significantly superior over untreated control. Indoxacarb 14.5@ SC, gave maximum grain yield of chickpea in compared to other treatments as well as in managing the population of *H. armigera*. Besides Neem seed oil @ 5ml and karanj oil @ 5 ml were found the second and third most effective treatments respectively

Introduction

Gram (chick pea) is the crop of tropical, subtropical and temperate region and widely grown in Uttar Pradesh, Madhya Pradesh, Punjab, Rajasthan and Maharastra which is popularly used as a protein adjunct to starchy diets. Seeds are widely consumed as pulse and in the form of flour which is largely fed to the horse and eaten after roasting. Seeds of chick pea contain 17.1% proteins, 5.3% fats, 16.2% carbohydrates, 3.9 % fibres and 2.7% minerals. Moderate to high levels of resistance to cypermethrin and moderate resistance to endosulfan were recorded in field populations of *H. armigera*. The growing awareness of the hazards of pesticide use has created a worldwide interest in pest control agents of plant origin that are bioactive and yet ecologically safe. Hence, the present experiment was conducted to assess the performance of Neem Seed Kernel Extract (NSKE) along with safer new molecule Flubendiamide 39.35 SC as an effective combination of oviposition inhibitor and larvicidal effect for the management of *H. armigera* on chickpea.

Pod borer *Helicoverpa armigera* Hubner (Noctuidae: Lepidoptera) is one of the major pest of gram. The pest starts its attack at early stage and become severe during maturity stage of the crop. The pest accounts for 90-95% of total damage. A single larva of *H. armigera* can damage 25-30 pods of

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 815-818
© 2019 JEZS
Received: 06-11-2018
Accepted: 09-12-2018

Phool Chand
Department of Agricultural Entomology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, India

SK Mandal
Department of Agricultural Entomology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, India

Umesh Chandra
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Anil Kumar
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Phool Chand
Department of Agricultural Entomology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, India

Bio-efficacy of cyazypyr 10% OD, a new anthranilic diamide insecticide, against fruit and shoot borer on Brinjal

Phool Chand, SK Mandal, Umesh Chandra and Anil Kumar

Abstract
Leucinodes orbonalis Guenee (Pyraustidae: Lepidoptera) is the key pest of eggplant (also known as brinjal and aubergine). The yield loss due to this pest is to the extent of 70-92 percent. Five doses of cyazypyr 10% OD (60, 75, 90 and 105g a.i./ha in both the year 2011 and 2012) were sprayed every year for their efficacy along with fipronil 5% SC @ 60 g a.i./ha, Flubendiamide 40% SC @ 30g a.i./ ha and Profenofos 50% SC @ 500 g a.i./ ha as a standard check. In both the seasons 2011 and 2012, cyazypyr 10% OD @ 105 and 90g a.i./ha were superior to most of the other treatments in respect of percent shoot infestation. Cyazypyr @ 105g a.i./ha, however, was superior to its 90g a.i./ha dose after 10 days of 2nd and 4th spray. Flubendiamide 40% SC @ 30g a.i./ha, fipronil 5% SC@ 60g a.i./ha and profenofos 50% EC @ 500ga.i./ha were on a par among them in percent shoot damage in most of the observations. Flubendiamide, however, showed similar performance with cyazypyr 10% OD @ 90g a.i./ha in a few cases. Cyazypyr 10% OD @ 75 g and 60g a.i./ha were ineffective, and it is also safer to natural enemies.

Keywords: Brinjal, cyazypyr, *Leucinodes orbonalis* and natual enemies

Introduction
Brinjal (*Solanum melongena* L.) is one of the widely used vegetable crops by most of the people and is popular in many countries *viz.*, Central, South and South East Asia, some parts of Africa and Central America [4]. It is native of India and second largest brinjal producing country after China with 27.1% share. It is an important vegetable grown in all the seasons. Due to its nutritive value, consisting of minerals like iron, phosphorous, calcium and vitamins like A, B and C, unripe fruits are used primarily as a vegetable in the country. Hence, it is subjected to attack by a number of insect pests right from the nursery stage till harvesting [7]. Among the insect pests infesting brinjal, the major ones are shoot and fruit borer, *Leucinodes orbonalis* (Guen.), whitefly, *Bemicia tabaci* (Genn.), leafhopper, *Amrasca biguttula biguttula* (Ishida), and non insect pest, red spider mite, *Tetranychus macfurlanei*. Of these, L. *orbonalis* is considered the main constraint as it damages the crop throughout the year. This pest is reported from all brinjal growing areas of the world including Germany, Burma, USA, Srilanka and India. It is known to damage shoot and fruit of brinjal in all stages of its growth. The yield loss due to the pest is to the extent of 70-92 percent [1, 2, 5]. The infested fruits become unfit for consumption due to loss of quality and hence, lose their market value. Farmers largely follow the chemical method as it produces quick results. High-frequency application is the common scenario. However, these chemicals, in many cases, invited the problems of pesticide resistance, resurgence, secondary pest outbreak, environmental contamination, residual toxicity and toxicity to beneficial organisms and disturbance in homeostasis of natural populations. The new generation of pesticide molecules have been claimed to be effective as well as safer for non-target organisms [3, 6, 8, 9]. Therefore, the present study was conducted with an objective to evaluate the field efficacy of cyazypyr 10% OD against *L. orbonalis* in brinjal.

Materials and Methods
The experiment was conducted during the 2011 and 2012 in the University farm at Kalyani, West Bengal state of India. Brinjal 'Muktakeshi' was grown in plots measuring 5 m×5 m, at spacing of 1m x 0.75m with three replications during the period from mid- April to July, two years, following recommended package of practices.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(2): 387-389
© 2018 JEZS
Received: 04-01-2018
Accepted: 06-02-2018

Satya Narayan Satapathy
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Satya Narayan Satapathy
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Effect of bee pollination, *Apis mellifera* L. on yield and quality parameters of Bael (*Aegle marmelos* Correa)

Satya Narayan Satapathy and Umesh Chandra

Abstract
The present experiment was conducted to mensurate the pollination effect of *Apis mellifera* L. on yield attributing characters i.e. fruits per panicle, its weight and TSS percentage of cultivar "Narendra Bael 9" at Main Experiment Station, Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect visitors. The 'NB 9' cultivars were laden with floral buds panicle^{-1} within 7-10 days 0f emergence of new leaves and reached to its full bloom during the moths of May- June, when days were long and temperature was so high. From the four treatments, i.e. pollination by honeybee only, natural pollination with augmentation of honey bees, natural pollination and control (no pollination), maximum average number of fruit panicle^{-1}, average fruit weight and average TSS percentage were 27.3, 2.05 kg and 41.3% in natural pollination with augmentation of honey bees while minimum 1.3, 1.8 kg and 35.7% were observed in control. Similarly an increase of 2000.00%, 8.46% and 15.68% over control and 47.56%, 6.22% and 5.08% over natural pollination was observed in average number of fruit panicle^{-1}, average fruit weight and average TSS percentage under the treatment natural pollination with augmentation of honey bees.

Keywords: Pollination, *Apis mellifera*, Bael fruit panicle^{-1}, fruit weight, TSS percentage

1. Introduction
Pollination is defined as the transfer of pollens from the male portion of a flower to the female portion which is essential for the process of fertilization and production of fruits and/or seeds [1]. About 90% pollination is carried out by insects, 85% of which comprises the honeybees [2].The nature and extent of pollination can vary between crops, ranging from increasing the quality and quantity of fruits or seeds and increase genetic diversity within crop species [3]. Inadequate pollination can result not only in reduced yield but also in delayed yield and a high percentage of inferior fruits [4]. The insects of family Apidae are the most reliable agents for pollination. Among members of Apidae family, honey bees are particularly important pollinators as they are capable of carrying pollens with which they feed their immature stages, and in the process, the plants visited by them are benefited [5]. Bees are active when flowers are most receptive. Collection of pollens by bees usually ends before noon but nectar collection continuous into late afternoon. Bees visit the fruit producing flowers more often than the male blossoms and stay on them longer [6].

Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators like honeybees, hover fly, yellow wasp, carpenter bee, weevil, black ants, butterflies etc.[7] Emergence of new leaves commenced during the 2nd and 4th week of May and continued till July. The transfer of pollen requires some agents and animal pollinators such as honeybee, *Apis mellifera* L. play an important role for carrying out the pollination process [3]. The present study was planned to determine the effect of pollinators including honeybee (*Apis mellifera* L.) on yield and quality parameter of bael.

2. Materials and Methods
The present study was carried out under saline sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 metres from mean sea level] during 2014. A randomized block design (RBD) with four treatments and six replications was applied. Six different bael plants were selected

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2307-2308
Received: 08-01-2018
Accepted: 09-02-2018

MP Gautam
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Umesh Chandra
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

SN Singh
Subject Matter Specialist. KVK Sohana, Siddharthnagar, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Ramveer
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Ramesh Jaiswal
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

SK Yadav
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Correspondence
MP Gautam
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Correlation between *Helicoverpa armigera* (Hubner) population and Weather factors in chickpea (*Cecer aratinum* L.)

MP Gautam, Umesh Chandra, SN Singh, Ramveer, Ramesh Jaiswal and SK Yadav

Abstract
The present investigations entitled "Studies on population dynamics and management of *Helicoverpa armigera* (Hubner) on chickpea using botanicals" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2016. revealed that *Helicoverpa armigera* population were noticed for the first time during 46th SW of 2016 and respective mean population were 0.33 larvae/plant. Mean population of *Helicoverpa armigera* showed non-significant negative correlation with minimum (-0.335) and maximum temperature (-0.220) and rainfall (-0.266) while RH showed non-significant with positive correlation (0.394).

Keywords: Gram, *Helicoverpa armigera*, Correlation and Weather Factor

1. Introduction

Chickpea (*Cicer arietinum* Linn. Leguminacae) is one of the most important *rabi* pulse crop of India. The world area of chickpea is estimated to be about 135.40 lakh ha^{-1} at global level with production and productivity of 131.02 lakh tonnes and 968 kg ha^{-1} respectively. In India, the area, production and productivity 59 mha, 77.03 million tonnes and 890 kg ha^{-1}, respectively (Annonymous 2016) [1].

Gram Pod borer *Helicoverpa armigera* is one of the major pest of gram. The pest starts its attack at early stage and become severe during maturity stage of the crop. The pest accounts for 90-95% of total damage. A single larva of *Helicoverpa armigera* can damage 25-30 pods of gram in its life time. It feeds on tender shoots and young pods. It makes holes in pods and insert its half body inside the pod to eat the developing seeds. The pod borers inflict heavy crop losses from seedling to maturity and the losses reach at its peak when the pods appear. The seed yield losses due to *Helicoverpa armigera* were 75-90% and in some places the losses were up to 100%. The yield loss in chickpea due to pod borer was reported as 10 to 60 per cent in normal weather conditions, while it was 50 to 100 per cent in favorable weather conditions, particularly in the state where frequent rain and cloudy weather is prevailing during the crop season. These losses can be reduced by the application of insecticides. In favorable conditions pod borer may cause 90-95 per cent of pod damage (Kumar *et al.*, 2017).

Helicoverpa armigera is a conundrum and one of the most dominant insect pests in agriculture, accounting for half of the total insecticides usage in India for protection of crops. The problem of this pest is magnified due to its direct attack on fruiting structures, voracious feeding habits, high mobility and fecundity, multivoltine nature, overlapping generations, nocturnal behavior etc., (Sarode, 1999) [7]. At the same time adequate ecological data is prerequisite for integrated pest management, which can therefore be enhanced after determining the seasonal abundance (Mathur *et al.*, 2003) [5]. There are many environmental factors which influence the insect pest populations (Lode and Sharma, 1993) [3]. Among them abiotic factors play a vital role in multiplication and distribution of insect pests.

Method and Material

To know the effect of abiotic variables on the population of *Helicoverpa armigera*, simple correlation analysis was carried out. The result of the analysis has been presented in (Table-2) and details have been given here as below:

Correlation observed between the *Helicoverpa armigera* population and abiotic parameters showed non-significant positive correlation with minimum and maximum temperature, relative humidity while rainfall had non-significant negative correlation.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 06-08
© 2019 JEZS
Received: 03-11-2018
Accepted: 06-12-2018

Anil Kumar
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

MK Tripathi
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ram veer
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Anil Kumar
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

Studies on correlation co-efficient of larval population of *Helicoverpa armigera* in reference to weather parameters

Anil Kumar, MK Tripathi, Umesh Chandra and Ram veer

Abstract
Chickpea, (*Cicer arietinum* L.) is an important pulse crop world-wide. There are many constraints in the production of the crop, of which pod borer, *Helicoverpa armigera* Hubner is the notorious one which causes both quantitative and qualitative loss. Therefore, an experiment was conducted during *Rabi* 2010-11 and 2011-12. The larval population was recorded at weekly interval from a vegetative stage to till maturity and meteorological data was collected from the department of meteorology during crop season The results of the investigation on larval population of pod borer (*Helicoverpa armigera* Hubner) in relation to abiotic factors revealed that the appearance from 46 standard week to till 14 standard week. The correlation co-efficient with the population of *H. armigera* was significantly positively correlated with minimum temperature (0.5463 during 2010-11 and 0.7998 during 2011-12) and maximum temperature (0.5202 during 2010-11 and 0.6339 during 2011-12) respectively. While relative humidity (-0.3536 during 2010-11 & -4191) and rainfall (-0.14966 during 2010-11 & 0.3343 during 2011-12) showed negative correlation.

Keywords: Pod borer, correlation, temperature, chickpea, R.H and rainfall

Introduction
Chickpea, (*Cicer arietinum* L.) is an important pulse crop in Bangladesh. There are many constraints in the production of the crop, of which pod borer, *Helicoverpa armigera* Hubner is the notorious one which causes both quantitative and qualitative loss. On an average, 30 – 40% pods were found to be damaged by this pest and an average of 400 kg/ha grain was lost by the borer (Rahman, 1990) [10]. In favourable condition, pod damage goes upto 90-95 percent (Shengal and Ujagir, 1990) [12]. Preference of insecticides depends on their easy availability and applicability, but their excessive and indiscriminate use has resulted in the development of insecticidal resistance in the pests and environmental pollution (Phokela *et al.*, 1990) [9].
Helicoverpa armigera Hubner (Lepidoptera: Noctuidae), the cotton bollworm, also known as the gram pod borer or the tomato fruit worm, is a polyphagous agricultural pest with a wide geographical distribution, recorded from Europe, Asia, Africa, Oceania, and recently South America. Larvae of *H. armigera* have been reported from over 67 host families, including Asteraceae, Fabaceae, Malvaceae, Poaceae and Solanaceae and this pest has caused losses to economically important crops such as cotton, legumes, sorghum, maize, tomato, soybean, ornamentalplants, and fruit trees (Krinski and Godoy, 2015) [6]. Marigold (Tagetes spp.) (Asterals: Asteraceae), a native of Mexico, is one of the most popular cut flowers in the world having the highest economic importance in the floriculture industry and comprises about 33 species (Adriana *et al.*, 2012) [1].
The area under floriculture production in India during the year 2015-2016 was estimated to be as 243 thousand hectares with a production of 2236 thousand metric tonnes (Anonymous, 2016) [2]. Among the various factors responsible for low yield of marigold in India, *H. armigera* is most important, which cause very heavy losses in yield. Excessive use of chemicals not only causes the economic restrain on farmers, but also produces the harmful side effects on the environments as well as mammals. The best way to overcome this situation is to destroy the pest at the initial stage of the life cycle (Chatar *et al.*, 2010) [3]. This is possible if timely prediction of the incidence of the pest can be made. Hence, an attempt was made to investigate the incidence of pod borer, *H. armigera* infesting marigold in relation to different abiotic factors.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 03-05
© 2019 JEZS
Received: 02-11-2018
Accepted: 05-12-2018

Anil Kumar
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

MK Tripathi
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ram Veer
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Anil Kumar
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

Seasonal incidence of *Helicoverpa Armigera* on chickpea crop in Eastern region of Uttar Pradesh

Anil Kumar, MK Tripathi, Umesh Chandra and Ram Veer

Abstract
Helicoverpa armigera is a polyphagous insect pest commonly known as gram pod borer. Present experiments was conducted at the Agriculture Farm, De partment of Entomology, Tilak Dhari Post Graduate College, Jaunpur during *Rabi* 2010-11 and 2011-12. The observation were recorded both year randomly selected plants at weekly interval from vegetative to maturity stage. The highest mean larval populations 5.60 per square meter in the first year were observed during the 48th standard week and in the second year it is 6.2 per square meter were observed during the 11th standard weeks. However, lowest mean larval population 0.40 per square meter in the first year were observed during the 14th standard week and in second year it is 0.90 per square meter were observed during the 1st standard week.

Keywords: Pod borer, incidence, larvae and chickpea

Introduction
Chick pea (*Cicer arietinum* L.) commonly known as gram or Bengal gram, is an important pulse crop cultivated globally. Its play an important role in the vegetarian diet as a major source of protein. It is consumed as a green vegetable, dal, chhole, germinated breakfast food and powder to prepare sweets and many other relishing dishes. Its leaves are consumed both raw and cooked to take advantage of malic acid, citric acid, mineral matter and fiber, all of which are of medicinal value. The grain consists of 52-70% carbohydrates, 18-22.2% protein. Besides, it is a rich source of calcium, iron. Vitamin C (green stage) and'B_1'.
The crop occupies 8.74 million hectares with a production of 7.35 million tonnes and productivity with 8.41 q/ha in India (Anonymous, 2010) [1]. Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Gujarat, Andhra Pradesh, and Karnataka are the major chickpea producing states sharing over 95% area. Various factors responsible for low production and productivity of chick pea are poor genetic base, weeds, diseases and insect pests. Major insect-pests of chickpea are cutworm (*Agrotis ipsilon* Hufnagel), gram pod borer (*Helicoverpa armigera* Hubner), gram semilooper (*Autographa nigrisigna* Walker), aphid (*Aphis craccivora* Koch) and tur pod bug (*Clavigralla gibbosa* Spinola) (Sithanantham *et al*., 1984) [6].
Gram pod borer, *Helicoverpa armigera*, is considered as a notorious pest of chickpea. It also attacks pigeon pea, moong bean, lentil, soybean okra, maize, berseem, sunflower, sorghum, tobacco and tomato. Besides gram pod borer, it is also known as cotton bollworm, gram caterpillar, tomato fruit worm and tobacco bud worm. Pod borer is the most serious insect pest of Chickpea. Percent larval survival and pupation were the maximum on chickpea as compared to other host plants (Ullah *et al.* 2015) [7].
Gram pod borer, *Helicoverpa armigera* (Hubner) (Lepidoptera: Noctuidae), a global and polyphagous pest equipped with multivoltine, diapauses is magnified due to its attack on reproductive stages, primarily on fruiting bodies, highly mobile and nocturnal in nature spread quickly in wide areas, found to cause economic damage to several cultivated crops *viz*., chickpea, pigeonpea, tomato, chilli, okra, etc throughout the year in India and sub-continent. The pest lays eggs on chickpea seedlings at second and third leaf stage of crop in Orissa. Its larvae appeared on chickpea crop after 15 days of germination at Dharwad, Karnataka. Singh and Ali (2006) [4] reported *H. armigera* larvae found active throughout the chickpea crop period at Faizabad, Uttar Pradesh (Singh *et al.* 2015) [5].

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 42-44
© 2019 JEZS
Received: 28-11-2018
Accepted: 30-12-2018

Anil Kumar
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

MK Tripathi
Department of Entomology, T.D.P.G. College, Jaunpur, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Ram veer
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Umesh Chandra
Department of Entomology, N.D. University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Economics of botanicals and biopesticides especially in reference to management of *Helicoverpa armigera* in chickpea crop

Anil Kumar, MK Tripathi, Umesh Chandra and Ram veer

Abstract
The field experiment was carried out at the Agriculture Farm, Department of Entomology, Tilak Dhari Post Graduate College, Jaunpur during *Rabi* 2010-11 and 2011-12 with three replications and seven treatments of Biopesticides, against *Helicoverpa armigera*. The Biopesticides like NSKE, *Bacillus thuringiensis*, Neem leaf extract, Neem oil, Nimbicidine and nuclear polyhedrosis virus in reducing the infestation of gram pod borer, *Helicoverpa armigera* and providing a higher net return per rupee invested. The higher grain yield of 24.07 Q./ha and22.65 Q/ha was recorded with the application of NSKE @ 5 per cent /ha during both years. The most favourable cost benefit ratio was obtained from the plot treated with Neem leaf Extract @ 5 per cent 31.82 and 22.22 followed by Neem leaf Extract @ 5 per cent 31.82 and 22.22, Neem oil @ 2 per cent 22.59 and 20.94, NSKE @ 5 per cent 19.68 and 15.06, Nimbecidine @ 2 per cent 16.16 and 15.04, Ha NPV @ 450 LE/ ha 9.34 and 6.28, Bt.1 kg /ha 6.40 and 4.91 during both years.

Keywords: Podborer, biopesticide, NPV and chickpea

Introduction
Chickpea (*Cicer arietinum* L.) is grown widely in the world because the seeds are a rich source of protein for the rapidly increasing population. However, the production and productivity of chickpea have been experienced drastically because of biotic and abiotic stresses. In India, chickpea crop is mainly known for protein source, grown in tropical, subtropical and temperate regions. India ranks first among the chickpea growing nations in terms of production and cultivated area.

Biopesticides based on microbial and botanical products are efficacious and promising agents. Neem, *Azadirachta indica* A. Juss. is known to affect larvae of various lepidopteran and coleopteran pests. *Bacillus thuringiensis* (Bt) is a spore-forming, gram positive bacteria which produces proteinaceous crystal at the time of sporulation. These crystals have shown potential against lepidopteran, dipteran and coleopteran pests. In India, scientists have done extensive studies on evaluation of NPVs and developed technologies for successful application of indigenous NPV preparations to combat *H. armigera infesting* chickpea. The pod borer *Helicoverpa armigera* Hübner (Lepidoptera: Noctuidae) is among the most threatening plant pests, cosmopolitan in distribution and polyphagous in herbivorous nature (Wakil *et al.*, 2009a and 2009b) [9, 10]. The larvae of *H. armigera* feed on leaves and stems but, they prefer buds, inflorescences, fruits and pods, thus causing significant damage to both vegetative and reproductive plant parts (Moral Garcia, 2006) [7]. A total of 500 US million worth of soybean and cotton has been lost in Brazil by *H. armigera* where it has been introduced in the recent past (Czepak *et al.*, 2013) [2]. The *H. armigera* is the key production constraints in several crops including chickpea, pigeonpea, pea, lentil chilies, Sun flower, Tomato, to bacco and cotton crops. A viable and sustainable method for this polyphagous pest using the conventional approach of relying primarily on chemical pesticides has become increasingly costly now days, and resistance in several pest species, environmental impact, safety and accumulation of residues has been the primary cause of concern. Hence, there is an urgent need for the development of environment friendly management by adopting insect

Materials and Methods
The experiment was conducted at the Agriculture Farm, Department of Entomology,

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(3): 976-977
© 2018 JEZS
Received: 04-03-2018
Accepted: 06-04-2018

Ajay Kumar Chauhan
Department of Entomology N.D. Univ. of Agri. & Tech., Kumarganj, Faizabad, Utter Pradesh, India

Umesh Chandra
Department of Entomology N.D. Univ. of Agri. & Tech., Kumarganj, Faizabad, Utter Pradesh, India

PK Gupta
Department of Entomology N.D. Univ. of Agri.& Tech., Kumarganj, Faizabad, Utter Pradesh, India

Correspondence
Ajay Kumar Chauhan
Department of Entomology N.D. Univ. of Agri.& Tech., Kumarganj, Faizabad, Utter Pradesh, India

Evaluate the pollination efficiency of different insect pollinators in mango (*Mangifera indica* L.) *var.* amrapali

Ajay Kumar Chauhan, Umesh Chandra and PK Gupta

Abstract
In the present resurch Amrapali var. of mango was taken to study the insect pollinators efficiency at main experimental station (MES) Horticulture & Apiculture laboratory NDUAT kumarganj Faizabad (U.P.) India during 2014. Pollination efficiency can be find out based on time spend (sec/flower), no. of flower visited by insects/min. & no. of loose pollen grains/foragers. Apis mellifera L. are the most efficient pollinators of mango flowers followed by Blue bottle fly & Apis dorsata under agro- ecological conditions of NDUA&T kumarganj Faizabad.

Keywords: Insect-pollinators, mango, forraging rate, forraging speed, pollen grains

Introduction

The flowering duration in mango is usually of short i.e. 2-3 weeks. The flowers of mango are polygamous and produce on terminal panicles varying in length from a few inches up to two feet. Each panicle carries from 200 to 300 up to more than 4000 flowers depending upon the variety and climatic conditions. Mango flowers are usually very tiny (6-8mm in diameter). The calyx is composed of 5 sepals and the corolla of 5 whitish to pinkish petals. All this inserted on a hemispherical disk. Mango trees bear two types of flowers: the hermaphrodite and the male flower. They are both of the same size and give the inflorescence a sweet smell. The pollen grains are oval or triangular or oblong shapes ranging from 20-35 micron. The nectar production was continuous and in small amounts on an average 0.045 micro liter/flower. Mango is mainly cross pollinated as 65% of the perfect flowers were never pollinated, indicating that wind is not an effective pollinating agent.

Material and methods: the pollination studies in mango variety Amrapali was carried out under sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during 2014. The foraging rates of different type of insect visitors were recorded in the term of flowers visited /pollinators/minute. Foraging speed of bees will be recorded in terms of the time spent per flower (in seconds) by each species. The number of loose pollen grains will be collected from the body of insect visitors. Observe on an average 10 individuals of each insect species for counting the pollen grains.

Result and discussion: The average maximum foraging rate was token by *A. mellifera* (12.48 flowers / 5 min.), followed by Syrphid fly (12.13 flowers / 5 min.), Blue bottle fly (10.32 flowers / 5 min.), *T. irridipennis* (7.19 flowers / 5 min.) and *A. dorsata* (6.21 flowers / 5 min.) respectively. The average minimum foraging rate was recorded from *A. florea* (5.98 flowers / 5 min.). The average maximum foraging speed was recorded from blue bottle fly (9.37 Sec. / flower), followed by *A. dorsata* (11.39 Sec. / flower), Syrphid fly (12.68 Sec. / flower), *T. irridipennis* (13.37 Sec. / flower) and *A. florea* (13.88 Sec. / flower) respectively. The average minimum foraging speed was recorded from *A. mellifera* (14.62 Sec. / flower). The average no. of maximum loose pollen grains adhere to the body of *A. mellifera* (2000 pollen grains/bees), followed by *A. dorsata*, *A. florea*, *T. irridipennis* and Syrphid fly with 1353, 1137, 832 and 413 pollen grains/foragers respectively, and the average no. of minimum loose pollen grains was adhere to the body of Blue bottle fly (335 pollen grains/flies). On the basis of this finding *Aapis mellifera* L. was most efficient followed by blue bottle fly and *Apis florea* Fab. was least efficient pollinators.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(4): 1633-1636
© 2018 JEZS
Received: 06-05-2018
Accepted: 07-06-2018

Ramesh Jaiswal
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

MP Gautam
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Yadav
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Giri
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ramveer
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Ramesh Jaiswal
Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Study on availability of bee flora and foraging activities of honey bee in Eastern Uttar Pradesh

Ramesh Jaiswal, Umesh Chandra, MP Gautam, SK Yadav, SK Giri and Ramveer

Abstract
The present investigation entitled "study on availability of bee flora and its foraging activities in eastern Uttar Pradesh", was carried out on the honeybee foraging activities were recorded on different agricultural and horticulture crops during *Rabi* season 2016-17. It was observed that the bee-flora consists of mostly, fruits and agriculture crops like spices, pulses, cereals, oil seed/yielding, fiber, and fodder crops etc. *Brassica rapa* were the major agricultural bee crops of the area with flowering period of three (3) and four (4) months respectively. These plants species served as the excellent sources of pollen and nectar in the study area. The result revealed that 10 crops were useful to honeybees, out of which 5 crops were agricultural crops like as Mustard, pigeon pea, gram, bakla etc. and 4 horticulture crops like as mango, lemon, guava, anola and the forest plant like as eucalyptus, which are well distributed and commonly found in the study area. The identified flora was further grouped into pollen, nectar and both pollen and nectar yielding plants out of 5 agricultural bee crops, three (3) plants were nectar yielding, one (1) pollen yielding and six (6) plants species were both pollen and nectar yielding

Keywords: Honeybee, *Apis mellifera,* bee flora and foraging activities etc.

1. Introduction
Flowers are the mainstay of the bee's life. From flowers,, they obtain pollen, the protein rich food used mostly to feed the carbohydrate fuel for their flight, foraging, hive activity and for rearing brood. The abundance of bee flora and their continuous availability is one of the major pre-requisites for successful beekeeping. This enables the beekeepers to exploit these sources to the maximum utilization by the bees. Every region has its floral dearth periods of short or long duration and it is essential to manage the honey bees and bee hives in the dearth period. As during this period, there is lack of availability of nectar and pollen in flora required for quantitative and qualitative production of honey.[1]. To overcome this problem. It is important to find out the suitable bee flora available in the locality to propagate and manage the plant species with a option of abundant nectar and or pollen to overcome the problem during the dearth period for commercial apiculture [4]. The present bee fauna dates back to Cretaceous period which is more that 70 mya. Bees are members of the kingdom Animalia, the phylum Arthropods, the class Insecta and the order Hymenoptera (from the Greek hymen, for membrane, and Petron, for wing) [2]. This order includes over 100,000 diverse species of bees, wasps, ants, and saw flies that have been identified and described. The most important characteristic of most members of this order for the understanding of layman is a "wasp waist" which is narrow area between the thorax and the abdomen. Of course, they also all have two pairs of wings, multi-segmented antennae and a few species have a piercing ovipositor [5].
The floral sources and its blooming period are the main indicators and tools for modem beekeeping in India. The bee plants are grouped into forest plants, horticultural /agricultural plants and pastures and hay fields [9]. In India, 50 million hectares of land is under bee dependent. Bee keeping (or) apiculture is the maintenance of honey bee colonies commonly in hives by humans. A bee keeper/ Apiarist keeps bees in order to gather honey bee wax to pollinate crops (or) to produce bees for sale to other beekeepers. Normally bee keepers use three types of hives for example traditional hives, top bar and langstroth hives. Newton's bee hive model normally adapted by the honey bee keepers [6, 7, 12].
The characteristics of *A. mellifera* combined with the high demand for Honey products put beekeeping as a key activity for ecosystem conservation and economic development, thus

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(1): 1405-1407
© 2018 JEZS
Received: 11-11-2017
Accepted: 12-12-2017

Singh Devendra
Ph.D. Research Scholar
Department of Entomology,
C S Azad University of
Agriculture and Technology,
Kanpur, Uttar Pradesh, India

Gupta PK
Professor & Head,
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj Faizabad,
Uttar Pradesh, India

Chandra Umesh
Assistant Professor,
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj Faizabad,
Uttar Pradesh, India

Vikrant
Ph.D. Research Scholar
Department of Entomology,
C S Azad University of
Agriculture and Technology,
Kanpur, Uttar Pradesh, India

Kumar Akshay
Ph.D. Research Scholar
Department of Entomology,
C S Azad University of
Agriculture and Technology,
Kanpur, Uttar Pradesh, India

Correspondence
Singh Devendra
Ph.D. Research Scholar
Department of Entomology,
C S Azad University of
Agriculture and Technology,
Kanpur, Uttar Pradesh, India

Population dynamics of insect-pests of paddy and its correlation with weather parameters

Singh Devendra, Gupta PK, Chandra Umesh, Vikrant and Kumar Akshay

Abstract
This paper discusses the population dynamics of paddy and its correlation with weather parameters in Faizabad district of U.P. Occurrence and abundance of insect-pests of paddy on rice crop was monitored on rice variety Sarju-52 at Main Experimental Station of Narendra Deva University of Agriculture and Technology Kumarganj Faizabad (U.P.) during the season *kharif*, 2013. This investigation revealed that pest activity commenced from 35th Standard meteorological week (SMW) and continued to 49th SMW. Highest dead hearts (8%) of Yellow Stem Borer, *Scirpophaga incertulas* was found in the 38th SMW, the maximum population (2.40%) of Rice Hispa was recorded in the 36th SMW, the peak population of whorl maggot (2.50%) was estimated in the 42nd SMW. The highest population of the rice leaf folder and gundhi bug with 3.70% and 21.90% was found in the 40th and 43rd SMW, respectively. Yellow stem borer was positively correlated with sunshine hours and rice hispa with maximum temperature was found positively significant. The rice whorl maggot was positively non-significant with the maximum temperature, there were no negative correlations of rice leaf folder and rice gundhi bug was positively correlated with relative humidity.

Keywords: Rice leaf folder, *Scirpophaga incertulas,* minimum, maximum, temperature, correlation, pest, paddy, dead hearts, and population

1. Introduction
Rice, is the main staple food in India. Rice is mostly grown on the low-lying deltas of the Brahmaputra and Barak rivers. But its yield is greatly affected every year by various insect pests [3, 7]. Among the various insect pests of paddy, Rice hispa, *Dicladispa armigera* (Olivier) Yellow Stem Borer *Scirpophaga incertulas* (Walker), leaf folder, *Cnaphalocrosis mendinalis* (Guen), whorl maggot and rice gundhi bug *Leptocorisa accuta*. In the development of pest management strategies a detailed knowledge of the influence of abiotic factors on the pest insects is essential. Weather and climatic conditions are known to significantly affect the population dynamics of insect pests [9]. Knowledge of abiotic conditions, such as temperature, day length, rainfall and relative humidity can be used as important components in forecasting and predicting the severity of insect pest population [11]. Knowledge of insect-pests population dynamics is essential for developing sustainable crop protection strategies and for interpreting and forecasting the response of taxonomic groups to weathers patterns varying on a daily basis, seasonally, or as a long-term consequence of global climate change [6]. Information on population dynamics of insect-pests complex in relation to weather parameters under Faizabad conditions is lacking. Hence, considering the importance of insect-pests of rice an attempt has been made to study the population dynamics and its correlation with weather parameters.

2. Materials and Methods
For recording the population of insect-pests, the study was conducted at Main Experimental Station of Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad-224229 (U.P.) during *kharif*, 2013. Total experimental plot size measured 10x10m. The seedlings were transplanted in the experimental plot with spacing 10 cm between plant to plant and 15 cm row to row. 21 days old seedlings of Sarju-52 rice variety were transplanted in IInd fortnight of July from the nursery sown 21 days ago, in experimental year. The normal cultural practices were performed throughout the growing season of the crop.
Method of Data Collection: Data collection was started after fifteen days of transplanting and subsequent at weekly intervals, using also sweeping method as per need. For insect-pests population, visuals counts of the numbers of insects/10 hills in plot were taken.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(2): 1271-1273
© 2018 JEZS
Received: 09-01-2018
Accepted: 10-02-2018

Singh Devendra
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Gupta PK
Professor & Head, Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Chandra Umesh
Assistant Professor, Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Vikrant
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Kumar Akshay
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Correspondence
Singh Devendra
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Efficacy of insecticides on yellow stem borer, *Scirpophaga incertulas* in rice crop

Singh Devendra, Gupta PK, Chandra Umesh, Vikrant and Kumar Akshay

Abstract
An experiment was conducting during *kharif*, 2013 at Main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) to evaluate the efficacy of some insecticides at different doses against the yellow stem borer *scirpophaga incertulas* (Walker) in rice ecosystem. The application of insecticides was done after transplanting, when the pest population reached at their ETL (Economic threshold level). The result shows that among all the insecticides (treatments), profenofos 40 + cypermethrin 4 (44 EC) 880 gm a.i. was most effective against the yellow stem borer, *scirpophaga incertulas* (Walker) (1.25 per cent) followed by profenofos 40 + cypermethrin 4 (44 EC) 440 gm a.i. (1.75 per cent) and conversely protected the crop. The least efficacy of treatment was found in lambda cyhalothrin 5 EC (3.75 per cent) treated plots. All the treatments were found effective and significantly superior over the control.

Keywords: transplanting, pest, population, ETL, efficacy, insecticides, *scirpophaga incertulas*, profenofos, lambda cyhalothrin

1. Introduction
Rice (*Oryza sativa* L.) is one of the most important staple food crop of Asia and a primary stable diet of over half of the world population relying on rice as the major daily source of calories and protein [4]. Asia accounts for about 90% of the world's rice area and production. Among the rice growing countries, India has the largest area under rice in the world (about 44.6 mha) i.e. 28% of the world's area of production, and ranks second next to China. The share of India to the world's production is near about 22.1 percent [2]. Uttar Pradesh contributes 56.57 lakh ha area and 119.92 lakh ton production with productivity of 2.12 t/ha in comparison to Punjab with maximum productivity (3.82 t/ha) of rice in India [1]. Rice yield in south and south-east Asia fluctuate yearly and adverse only about 2 tonnes/ha or less. The two major factors responsible for poor yield are adverse weather (flood, drought, typhoons etc.) and pest epidemic. Present investigation on yellow stem borer *scirpophaga incertulas* (Walker) of paddy was conducted during *kharif*, 2013 at the main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) to estimate the effectiveness of insecticides against yellow stem borer. The rice plant is subjected to attack by more than 100 species of insects, 20 of them can cause economic damage. Together they infest all parts of the plant at all growth stages, and a few transmit viral diseases [5]. Ric e yellow stem borer (YSB), *Scirpophaga incertulas* (Walker) of national importance as their incidence has significant impact on rice yields across the diverse rice ecosystems.

2. Materials and Methods
The experiment was conducted during the kharif of 2013, at Main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) in a Randomized Block Design (RBD) with eight treatments and four replications in plot size measuring 11 x 5 sqm. The treatments were *viz*., Profenofos 40%+ Cypermethrin4% (44) EC @ 220 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 330 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 440 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 880 (g./ha.), Profenofos 50 EC, Cypermethrin 10EC and Lamda cyhalothrin 5 EC including an untreated or control against yellow stem borer *Scirpophaga incertulas* (Walker). The insecticides were applied as and when the pest population reached at their ETL (Economic threshold level) with their respective doses as mentioned in Table-1.

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 975-980 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

POPULATION DYNAMICS OF MAJOR INSECT-PESTS AND THEIR NATURAL ENEMIES ON OKRA (*ABELMOSCHUS ESCULENTUS* L.) CROP IN FAIZABAD (UP)

Abhishek Kumar Chaudhary[1], P.K. Gupta[1], Umesh Chandra[1], Chandan Kumar Singh[2] Rahul Kumar Singh[3], *Dharmendra Singh[2] and Vikas Kumar Singh[2]

[1]Deptt. of Entomology, [2]Deptt. of Pathology, [3]Deptt. of Extension Education, N.D.U.A. & T., Faizabad -224229, India

**E-mail :* dmdm8780@gmail.com

ABSTRACT

The present field experiment was conducted during kharif season of year 2013 and 2014 at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India to study the population dynamics of okra insect-pests and their natural enemies. The result revealed that major insect-pests and their natural enemies in Okra started from 2nd and 3rd week of August on 4-5 week-old plant-5 s and continued until fourth week of December on 25-week-old plant-5 s.. Investigations on Population dynamics of major insect-pests and their natural enemies on Okra revealed association of a total 12 arthropods with this crop. Among these seven viz- whitefly (*Bemisia tabaci*), jassid *Amrasca biguttula* (Dist.), Thrips *Thrips tabaci* (Lind.), Fruit borer *Helicoverpa armigera* (Hb.), okra shoot and fruit borer *Earias vittella* (Fabricius), aphid, *Aphis gossypii* (Glov.), and leaf hopper, *Amrasca devastans*. Five viz- lady bird beetle Coccinella septumpuntata and *Cheilomenes undecimpuntata* Linn.,) and predatory spider *Oxypus* spp. Green Lace wing *Chrysoperla Carnea* (Stephens) Mrid bug and Ants were recorded as natural enemies associated with this crop. The appearance of the major insect pests from 31th SW observed to 50 SW during *Kharif* 2013 and *Kharif* 2014 0.57 leaf hopper /plants at 30th SW during *Kharif* 2015 respectively.

Key words : *Whitefly, Jassid, Thrips, Fruit borer, Okra shoot and fruit borer Earias vittella aphid, and leaf hopper.*

The okra, *Abelmoschus esculentus* L. (Malvaceae) is an important vegetable of India and eaten by people with a great interest. The okra crop is infested by a number of insect pests like *Amrasca devastans, Earias vittella, Bemisia tabaci, Helicoverpa armigera, Acrocercops bifasciata, Thrips tabaci, Aphis gossypii, Podagrica, Anomisflava, Sylepta derogata, Haritalodes dervgata, Dysdercus koengii* and *Nezara viridula*. But *Amrasca devastans, E. vittela, H. armigera* and *B. tabaci*, are the notorious and major insect pests of okra (Dubey *et al.*, 1999; Basu, 1995; Lohar, 2001). Insect pest infestation not only reduce the growth but also transmit pathogenic diseases (Sheedi, 1980; Dhaliwal *et al.*, 1981). This challenging situation invites attention of entomologists to concentrate energies on integrated pest management (IPM) of okra and other crops (Huffaker and Carl, 1980; Dhaliwal *et al.*, 1981; Mahadevan and Chelliah, 1986; Dubey *et al.*, 1999; Kumawat *et al.*, 2000) Botanical insecticides (Neem oil or biosal and tobacco extracts), microbial control (Bacillusthuringiensis) and biological control agents (spider, ant, lady bird beetle, Orius, myrid bug, Laius, Chrysoperla, Trichogramma etc.) should be integrated for economic management of insect pests (Arora, *et al.*, 1996; Abro et al., 2004; Memon et al., 2004).

MATERIALS AND METHODS

The experiment was conducted at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the plot size 600m^2 following recommended practices during Kharif 2013 and 2014. Date of sowing- 12th July 2013 and 16th July 2014. The okra (cv. Arka Anamika) was sown in well prepared soil on ridges. The distance between row to row was 60 cm, and plant-5 to plant-5 45cm. The seed rate was 8 kg per acre. Observations were recorded on five randomly selected plant-5 s at weekly intervals starting with 14 days after sowing (DAS) till harvesting in terms of number of arthropods, per plant-5 using rectangular cage 45cm long, 30cm wide and 90cm high, according to the stage of crop at Student Structional Form, between 5-7 A.M. Larval population of shoot & fruit borer and fruit borer was recorded at weekly intervals on 5 randomly selected plant-5 s starting with 50 % flowering till harvest. The data of the treatments were recorded at weekly intervals. While recording the data, it was noted that the observations on insect pests and predators should be recorded early in the morning because of flying and moving of these creatures. The observations were recorded through tagging 5 plant-5 s selected at random in each treatment. The populations of sucking insect complex were recorded as per leaf, from five leaves by selecting one from top, 2 from middle and 2 from bottom portion of plant-5, while the population of chewing insect pests and predators were recorded as per plant-5. The pre-treatment observations were recorded before employing plant-5 protection tactics, while post-treatment observations were recorded 48 hours after application of the respective bio-rational pesticide. Weekly Meteorological data during crop was collected from Agro meteorological observatory N. D. University Agriculture

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(1): 904-906
© 2018 JEZS
Received: 01-11-2017
Accepted: 02-12-2017

MP Gautam
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

Umesh Chandra
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

SK Yadav
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

Ramesh Jaiswal
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

SK Giri
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

Shesh Narain Singh
Subject Matter Specialist (Agril. Extension) KVK., Masodha Faizabad, UP, India

Correspondence
MP Gautam
Department Of Entomology
N.D. University of Agriculture & Technology, Kumarganj, Faizabad, (UP), India

Studies on population dynamics of garm pod borer *Helicoverpa armigera* (Hubner) on chickpea (*Cicer arietinum* L.)

MP Gautam, Umesh Chandra, SK Yadav, Ramesh Jaiswal, SK Giri and Shesh Narain Singh

Abstract
The present investigations entitled "Studies on population dynamics of *Helicoverpa armigera* (Hubner) on chickpea" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2016. It is evident from the data that the *Helicoverpa armigera* population was started since the vegetative stage and continued up to maturity stage of the crop. Larvae were found on whole plant. Due to its attack, the leaflets become cup shaped and yellow at the edges. Heavy infestation whole plant become dried and finally defoliate at last.
Helicoverpa armigera population were noticed for the first time during 46th SW of 2016 and respective mean population were 0.33 larvae/plant.The lowest mean population *H. armigera* is 0.33larvae/plantwas recorded during 46nd and 47th SW at the minimum temperature of 11.8 °C, maximum temperature of 29 °C, relative humidity 67.4 and there were no rainfall. Whereas maximum mean population of *Helicoverpa armigera* population of 5.67 larvae/plant was recorded during 08 SW of 2017 at the minimum temperature of 11.1 °C, maximum temperature of 27.9 °C, relative humidity 63.9 and there were no rainfall.

Keywords: Gram, *Helicoverpa armigera* and population dynamics

Introduction
India ranks first in the production and consumption of chickpea (*Cicer arietinum* L.) in the world. Chickpea is a most important pulse crop of India which is mostly grown under dry land condition with heavy cloudy soil. It is a rich source of nutritional values in the diet of Indian people because of containing 21.5 per cent protein, 64.5 per cent carbohydrates and 4.5 per cent fat which is comparatively deficient in the cereals and oilseeds. Its green leaves and pods are used as green vegetables and germinated graiñs for breakfast and other delicious dishes by the people in their daily meals.
Gram pod borer, *Helicoverpa armigera*, is considered as a notorious pest of chickpea. It also attacks pigeon pea, moong bean, lentil, soybean okra, maize, berseem, sunflower, sorghum, tobacco and tomato. Besides gram pod borer, it is also known as cotton bollworm, gram caterpillar, tomato fruit worm and tobacco bud worm. Pod borer is the most serious insect pest of Chickpea. Percent larval survival and pupation were the maximum on chickpea as compared to other host plants.

Materials and Methods
The gram crop regularly was monitoring for occurrence of insect-pests from germination to pre-harvest stage of the crop at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad. Insect pest population was recorded on 5 randomly selected plants at weekly interval in each plot after germination (Table-1). The mode of observation for *Helicoverpa armigera* are the ETL (3 eggs or 2 larvae/plant) regular weekly recording selected plat of gram pod borer population was done from 50% flowering till harvested in the experimental field.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(4): 570-572
© 2017 JEZS
Received: 11-05-2017
Accepted: 12-06-2017

SN Satapathy
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Correspondence
SN Satapathy
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Pollination efficiency of insect pollinators on *Aegle marmelos* Correa. At Kumarganj, Faizabad

SN Satapathy and Umesh Chandra

Abstract
In the present research the variety "Narendra Bael 9 (NB 9)" was taken to study the insect pollinator's abundance and their pollination efficiency at Main Experiment Station (26.47°N latitude, 82.12° E longitude and 113 meters altitude), Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. The hymenopterans were the major floral visitors comprising of six species from four families *viz*., Xylocopidae, Apidae, Vespidae and Formicidae, followed by dipterans (One species from one family) *viz*., Syrphidae, Lepidoptera (three species from two families) *viz*., Pieridae and Arctiidae. The abundance of *Apis dorsata* was highest (7.90 bees/spike/5 minutes) followed by syrphid flies, *Eupeodes corolae* (3.45 visitors/spike/5 minutes) and *Apis mellifera* (1.20 bees/spike/5 minutes). Based on pollination index (Number of loose pollen grains sticking on the body of visitors × abundance), *A. dorsata* was found to be the most efficient pollinator of bael flowers followed by *Eupeodes corolae* and *A. mellifera* under agro-ecological conditions of Kumarganj, Faizabad (India).

Keywords: Abundance, pollinator, pollination efficiency, pollination index, pollen grain, bael

1. Introduction
Bael (*Aegle marmelos* C.) belongs to family rutaceae and it is known in India from pre-historic time [6]. In nature, only about 5 per cent of the flowers are self-pollinated and 95 per cent animal pollinated [5]. Bael is mostly cross pollinated fruit crop which has entomophilous flowers and pollination is carried out by various insect pollinators like honey bees (*Apis dorsata*, A. *mellifera*),hover flies, yellow wasp, carpenter bee, weevil, black ants, butterflies etc. [4]. Bees are the best among all pollinators. Butterflies are occasional pollinators, and do pollination of crops while feeding on nectar from one flower to another. Flies, hoverflies and wasps are effective pollinators because they visit flowers to feed upon nectar (or in some species pollen) for essential nutrients for egg maturation and extending their life-span [2]. Being a cross pollinated crop, its fruit set is expected to be affected by the insect visitors. The investigation was carried out on the pollination efficiency, which is defined as the proportion of pollinated flowers relative to those that experienced pollen removal.
The present studies were conducted with the objectives to know pollinators abundance and pollination efficiency of pollinator species.

2. Materials and Methods
The pollination studies in bael variety, "NB 9" was carried out under sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 metres from mean sea level] during 2014.

2.1 Abundance of insect visitors: Abundance (number of visitors/ spike/5 minutes) of major pollinators was recorded from six randomly selected bael plants. These observations were recorded from 6:00 am to 6:00 pm at an interval of 3:00 hours. Observations were recorded for 7 days each after the initiation of 10% flowering in crop, at peak flowering and before the cessation of flowering in the crop.

2.2 Loose pollen grains sticking on the body of insects visitors: For estimating the number of loose pollen grains sticking to the body of major insect pollinator species, the insect pollinators were captured gently by forceps from the flowers to avoid shaking of body and the

NAAS-5.38
2017

Int.J.Curr.Microbiol.App.Sci (2017) Special Issue-4: 116-124

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-4 (September-2017) pp. 116-124
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Population Dynamics of Spider in Rice Crop Regarding Bio-Control

Umesh Chandra[1*], I. B. Singh[2] and H. M. Singh[1]

[1]Department of Entomology, N.D.University of Agriculture & Technology Kumarganj, Faizabad, U.P. (224229), India
[2]Department of Entomology, T.D.P.G. College, Jaunpur, U.P., India
**Corresponding author*

A B S T R A C T

The Wolf spider, *Pardosa psedonmulata* (Boes. & Strand) is probably the most important predator in rice fields in Asia. The diet of the wolf spider depends on type of insects that are available but leaf hoppers and plant hoppers are the major prey *Pardosa* feeds on both nymphs and adults and is considered to be a major regulator of brown plant hopper population. The first step in determining of the role of spiders in an agro- ecosystems is to identify the species present and determine their abundance and distributions. The biotic and abiotic factors of an environment often play an important role on the population buildup of spider. The experiment was carried out during Kharif session on rice variety Pant Dhan – 4 and NDR -359 at research field and on farmers field Sarjoo – 52, NDR -359, Pant Dhan – 4 and Sambha Mahsoori varieties was taken. The experiment was laid out and randomized in block designed with three replication plot size was assigned 7x25 m with border area of 1.5m between the replication. The transplanting was done in the first week of July both the year and observations were recorded with the help of hand net and quadrate methods at weekly interval starting at two weeks after transplanting and continue till maturity of crop. Also spider population data was recorded during off session, Main crop was harvested 6-7 cm above from the ground level and then given an irrigation after 20 days of harvesting. After four days of irrigation, area was applied and subsequent irrigation were also given as and when required and taken ratoon crop during off session. Observations on the hoppers and spiders population were recorded after 45 days of harvesting at weekly interval started from 45th to 18th meteorological week. Fourteen spider species was observed during studies viz., *Pardosa pesudoannulata* (Boes. & Str.), *Tetragnatha mandibulata* (Walk), *T. javana* (Thorell), *Hippasa holmerae* (Thorell), *Clubiona japonicola* (Boes. & Str.), *Araneus* spp., *Phidippus* spp. and *Neosconatheisi* (Walck). Amongst these *Pardosa pesudoannulata, Tetragnatha mandibulata* during kharif session and *Hippasa holerae, T. javana* and *Tetragnatha mandibulata* during off session were found dominant.

Keywords

Population dynamics, spider, weather factor

Introduction

Paddy (*Oryza sativa* L.) is one of the most important staple food crop of global importance. Rice helps to feeds almost half of the planet on a daily basis however at national level to feed the ever growing population and maintain our food security an additional two million tons of rice needs to be produced annually with less water, land and against a number of biotic and abiotic stresses that limits rice production.

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 975-980 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

POPULATION DYNAMICS OF MAJOR INSECT-PESTS AND THEIR NATURAL ENEMIES ON OKRA (*ABELMOSCHUS ESCULENTUS* L.) CROP IN FAIZABAD (UP)

Abhishek Kumar Chaudhary[1], P.K. Gupta[1], Umesh Chandra[1], Chandan Kumar Singh[2] Rahul Kumar Singh[3], *Dharmendra Singh[2] and Vikas Kumar Singh[2]

[1]Deptt. of Entomology, [2]Deptt. of Pathology, [3]Deptt. of Extension Education, N.D.U.A. & T., Faizabad -224229, India

***E-mail :** dmdm8780@gmail.com

ABSTRACT

The present field experiment was conducted during kharif season of year 2013 and 2014 at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India to study the population dynamics of okra insect-pests and their natural enemies. The result revealed that major insect-pests and their natural enemies in Okra started from 2nd and 3rd week of August on 4-5 week-old plant-5 s and continued until fourth week of December on 25-week-old plant-5 s.. Investigations on Population dynamics of major insect-pests and their natural enemies on Okra revealed association of a total 12 arthropods with this crop. Among these seven viz- whitefly (*Bemisia tabaci*), jassid *Amrasca biguttula* (Dist.), Thrips *Thrips tabaci* (Lind.), Fruit borer *Helicoverpa armigera* (Hb.), okra shoot and fruit borer *Earias vittella* (Fabricius), aphid, *Aphis gossypii* (Glov.), and leaf hopper, *Amrasca devastans*. Five viz- lady bird beetle Coccinella septumpuntata and *Cheilomenes undecimpuntata* Linn.,) and predatory spider *Oxypus* spp. Green Lace wing *Chrysoperla Carnea* (Stephens) Mrid bug and Ants were recorded as natural enemies associated with this crop. The appearance of the major insect pests from 31th SW observed to 50 SW during *Kharif* 2013 and *Kharif* 2014 0.57 leaf hopper /plants at 30th SW during *Kharif* 2015 respectively.

Key words : *Whitefly, Jassid, Thrips, Fruit borer, Okra shoot and fruit borer Earias vittella aphid, and leaf hopper.*

The okra, *Abelmoschus esculentus* L. (Malvaceae) is an important vegetable of India and eaten by people with a great interest. The okra crop is infested by a number of insect pests like *Amrasca devastans, Earias vittella, Bemisia tabaci, Helicoverpa armigera, Acrocercops bifasciata, Thrips tabaci, Aphis gossypii, Podagrica, Anomisflava, Sylepta derogata, Haritalodes dervgata, Dysdercus koengii* and *Nezara viridula*. But *Amrasca devastans, E. vittela, H. armigera* and *B. tabaci*, are the notorious and major insect pests of okra (Dubey *et al.*, 1999; Basu, 1995; Lohar, 2001). Insect pest infestation not only reduce the growth but also transmit pathogenic diseases (Sheedi, 1980; Dhaliwal *et al.*, 1981). This challenging situation invites attention of entomologists to concentrate energies on integrated pest management (IPM) of okra and other crops (Huffaker and Carl, 1980; Dhaliwal *et al.*, 1981; Mahadevan and Chelliah, 1986; Dubey *et al.*, 1999; Kumawat *et al.*, 2000) Botanical insecticides (Neem oil or biosal and tobacco extracts), microbial control (Bacillusthuringiensis) and biological control agents (spider, ant, lady bird beetle, Orius, myrid bug, Laius, Chrysoperla, Trichogramma etc.) should be integrated for economic management of insect pests (Arora, *et al.*, 1996; Abro et al., 2004; Memon et al., 2004).

MATERIALS AND METHODS

The experiment was conducted at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the plot size 600m^2 following recommended practices during Kharif 2013 and 2014. Date of sowing- 12th July 2013 and 16th July 2014. The okra (cv. Arka Anamika) was sown in well prepared soil on ridges. The distance between row to row was 60 cm, and plant-5 to plant-5 45cm. The seed rate was 8 kg per acre. Observations were recorded on five randomly selected plant-5 s at weekly intervals starting with 14 days after sowing (DAS) till harvesting in terms of number of arthropods, per plant-5 using rectangular cage 45cm long, 30cm wide and 90cm high, according to the stage of crop at Student Structional Form, between 5-7 A.M. Larval population of shoot & fruit borer and fruit borer was recorded at weekly intervals on 5 randomly selected plant-5 s starting with 50 % flowering till harvest. The data of the treatments were recorded at weekly intervals. While recording the data, it was noted that the observations on insect pests and predators should be recorded early in the morning because of flying and moving of these creatures. The observations were recorded through tagging 5 plant-5 s selected at random in each treatment. The populations of sucking insect complex were recorded as per leaf, from five leaves by selecting one from top, 2 from middle and 2 from bottom portion of plant-5, while the population of chewing insect pests and predators were recorded as per plant-5. The pre-treatment observations were recorded before employing plant-5 protection tactics, while post-treatment observations were recorded 48 hours after application of the respective bio-rational pesticide. Weekly Meteorological data during crop was collected from Agro meteorological observatory N. D. University Agriculture

J. Exp. Zool. India Vol. 20, Supplement 1, pp. 1431.-1433, 2017 www.connectjournals.com/jez ISSN 0972-0030

BIO-EFFICACY OF CERTAIN INSECTICIDES AGAINST RICE STEM BORER, *SCIRPOPHAGA INCERTULUS* (WALKER)

A. K. Singh, Maneesh Kumar Pandey, Pankaj Kumar and Vikram

Department of Entomology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad - 224 229, India.
*e-mail : awanisingh15@gmail.com

(Accepted 26 September 2017)

ABSTRACT : Spray of Cartap hydrochloride 75SG @ 375 g.a.i./ha was found most effective and minimum dead hearts of 0.66 and 0.73 per cent and 0.26 & 0.24 per cent were respectively recorded on 7th and 15th day after Ist and IInd application and was at par with higher dose of Cartap hydrochloride @ 750 g.a.i./ha (with respective damage of 0.75 and 0.83 and 0.34 & 0.33 per cent) and Fipronil 5 SC @ 25 ml/ha (with respective damage of 0.91 & 1.05 per cent and 0.53 & 0.50 per cent) on the same dates after Ist and IInd applications. Minimum white ear incidence of 0.18 per cent and 0.20 per cent was recorded on 7th and 15th day of 3rd application in Cartap hydrochloride 75 SG @ 375 g a.i. ha^{-1} treated plots and was at par with Cartap hydrochloride 75 SG @ 750 g. a.i. ha^{-1} (0.25 & 0.26 per cent), Fipronil 5 SC @ 25 ml ha^{-1} (0.43 & 0.45 per cent) and Cartap hydrochloride 75 SG @ 318.75 g. a.i. ha^{-1} (0.44 & 0.46 per cent). The remaining treatments were found effective and significantly superior over untreated control.

Key words : Bio-efficacy, *Scirpophaga incertulus*, incidence, *Oryza sativa*.

INTRODUCTION

Rice (*Oryza sativa*) is world staple food for large proportion especially inside East Asia and Indonesia. In India rice is cultivated in 44.10 m ha with production of 131.3 mt and average productivity of 3.0 t/ha (Ferrer, 2011). Pasalu *et al* (2007) have reported yellow stem borer as a pest of national significance which cause significant yield loss across the rice eco-system. Alam *et al* (1992) estimated the maximum stem borer infestation of (20.79%) in deep water followed by low land (12.60%) and medium land (7.83%). Yellow stem borer is a major rice damaging species in Eastern part of India as well as in Uttar Pradesh, which cause low production of rice in fragile eco-systems (Senapati and Panda, 1999). Therefore, the present study was conducted to test the efficacy of certain insecticides against yellow rice stem borer.

MATERIALS AND METHODS

For evaluating the bio-efficacy of insecticides the experiments were conducted during *Kharif* 2010 at Students' Instructional Farm, NDUAT Campus, Kumarganj, Faizabad (U.P.) India. Thirty days old seedlings of rice variety 27P77 were transplanted in 2nd fortnight of July under Randomized Block Design in 5 x 4 m plot size with 5 replications. At the time of transplanting spacing of 20 cm between row to row and 15 cm between plant to plant was maintained. All agronomical practices were adopted to raise a good crop. Soluble granules of Cartap hydrochloride 75 SG were sprayed in the standing crop under sufficient moisture in field. Amount of insecticides *viz*. 4 doses of Cartap hydrochloride soluble granules, Cartap hydrochloride 50 per cent SP, Lambda cyhalothrin 2.5 EC and Fipronil 5 SC were measured and diluted separately in the required amount of water (based on the crop stage) and sprayed thoroughly with the help of foot sprayer. First application of the treatment was done at 30 days after transplanting (DAT) followed by the second and third applications on 45 & 60 DAT, respectively. The data on dead heart (DH) and white ears (WE) caused by yellow stem borer were recorded at one day before and 7 and 15 days after treatment. For calculating the per cent damage total numbers of tillers/ panicles and damaged tillers/panicles (DH/WE) were counted in quadrate on 12 randomly selected hills at three places in each plot. The data were converted into per cent (DH/WE) with the help of the following formulae:

$$\text{Dead hearts \%} = \frac{\text{Number of damaged tillers/12 hills}}{\text{Total number of tillers (healthy + damaged)/12 hills}} \times 100$$

$$\text{White ears} = \frac{\text{Number of damaged tillers/12 hills}}{\text{Total number of panicles (healthy + damaged)/12 hills}} \times 100$$

Arc sine values and Critical Difference were also calculated to test the significance of mean for the treatments difference at 5 per cent level probability.

The Pharma Innovation Journal 2021; SP-10(11): 323-328

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(11): 323-328
© 2021 TPI
www.thepharmajournal.com
Received: 01-09-2021
Accepted: 03-10-2021

Deepak Kumar
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Rishabh Mishra
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Puneet Kumar
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author
Deepak Kumar
Department of Entomology, Acharya Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Incidence and intensity of bark eating caterpillar, *Inderbella spp.* infesting aonla trees

Deepak Kumar, Umesh Chandra, Rishabh Mishra and Puneet Kumar

Abstract
The studies on. Incidence and intensity of bark. eating caterpillar, *Indarbela* sp. revealed that in Agronomy Research Farm of ANDUAT, the minimum incidence was recorded in 1st SMW (65.73%) and maximum incidence was racorded in 48 SMW (86.89%).The average minimum number of active holes per infested tree were recorded in 1st SMW(.66) and maximum number of active holes were recorded in 36 SMW(7.36). In Main Experiment Station Horticulture of ANDUAT, the minimum incidence was recorded in 1st SMW (55.5%) and maximum incidence was racorded in 39 SMW (83.85%). The average minimum number of active holes per infested tree were recorded in 1st SMW(.56) and maximum number of active holes were recorded in 36 SMW(6.55). In Akma Research farm of ANDUAT, the minimum incidence was recorded in 33 SMW (44.78%) and maximum incidence was racorded in 48 SMW (83.85%). The average minimum number of active holes per infested tree were recorded in 33 SMW(.45) and maximum number of active holes were recorded in 35 SMW(3.33).

Keywords: bark eating caterpillar, incidence, intensity, aonla

Introduction

Indian gooseberry, (*Emblica officinali*) earlier considered a minor commercial fruit crop is turning into a major one. It is recognised as the king of the arid fruits. Its belong to family Euphorbiaceae and is vernacularly known as amla and aura in Hindi; dharti and amlaki in Sanskrit; amla and amlaki in Bengali. It is native of Tropical South Asia particularly central and southern India (Moortan, 1960). Popularly also known as Aonla, amla, amrit phal is found attacked various number of insect-pests causing considerable damage. In India, the major insect-pests like shoot gall maker (*Betousa stylophora*), bark eating caterpillar (*Inderbela quardinatata*) recorded as key pests, Nowthose, pomegranate butter fly (*Virchola isocrates*),cow bug (*Tricentrus congestus*), leaf roller or leaf rolling caterpillar (*Gacillaria acidula*), hairy caterpillar (*Selepa celtis*), aphids (*Schoutedeni aemblica*) and termite (*Odentotermis obesus*) have been recorded as minor pests on this plant (Chaudhary et al., 2005).

Bark-eating caterpillar, *Indarbela sp.* (Metarbelidae: Lepidoptera), is a polyphagous pest feeding on the bark of fruit, forest and avenue trees. The bark eating caterpillar is widely distributed throughout the Indian subcontinent, including Bangladesh, Myanmar, Sri Lanka and Pakistan (Sharma and Kumar, 1986).

Genus *Indarbela* has 13 different species, out of which three viz. *I. quadrinotata* (Walker), *I. tetraonis* (Moore) and I. dea (Swinhoe) have are found to be economic importance (Verma and Khurana, 1978). To reported about 70 host plants of the bark eating caterpillar representing fruit, avenue and forest trees.

The caterpillar of bark eating caterpillar is nocturnal nature and eats on the bark under shelter of web and bores into the trunk and branches. It retreats into the tunnel during day and continues to bore it to about 15 to 25 cm in length. Only one caterpillar is found inside a tunnel. Its infestation is indicated by the presence of peculiar winding web, prepared out of excretory pellets and frass spun together with silk, generally near the forks or angles on the stem and branches. In case of severe infestation moment of sap are stopped and plant ceases to flush (Verma and Khurana, 1978), thereby affecting fruit production

Method and Material

Studies on "Incidence and Intensity of Bark Eating Caterpillar *Inderbella sp.* Infesting Aonla trees. Were carried out in the Department of Entomology, college of Agriculture, A.N.D.U.A.&T. Kumarganj Ayodhya (U.P.) and in different Aonla growing location of

The Pharma Innovation Journal 2021; 10(10): 975-978

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; 10(10): 975-978
© 2021 TPI
www.thepharmajournal.com
Received: 05-08-2021
Accepted: 13-09-2021

Dharm Beer
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Jai Kumar Yadav
Department of Plant Protecton, ICAR-V.K.S. Krishi Vigyan Kendra Unnao, Unnao, Uttar Pradesh, India

Sameer Kumar Singh
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Dharm Beer
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Population dynamics of fruit flies in bitter gourd (*Momordica charantia* L.) and its relationship with weather factors

Dharm Beer, Umesh Chandra, Jai Kumar Yadav and Sameer Kumar Singh

Abstract
Bitter gourd (*Momordica charantia* L.) is one of the important cucurbitaceous vegetable grown in India. Among the cucurbits, it is considered a high-quality vegetable because of its nutritive value especially ascorbic acid and iron. The study was undertaken to investigate the population dynamics of *Bactrocera* spp. (Diptera: Tephritidae) round the year. Significant variation in occurrence of the pest was recorded during the period of investigation. First incidence of *Bactrocera* spp. was observed from 31st SM and continued upto 52nd SM in parapheromone Methyl Eugenol and Cuelure) traps. Peak incidence of the pest was recorded during 39th SM and 42nd SM with 135 fruit flies/trap/week. *B. zonata* and *B. dorsalis* incidence had significant positive correlation (r) of with minimum and maximum temperature (r = 0.563 and r = 0.564 respectively) during *Kharif* 2018. The *B. cucurbitae* traped had positive correlation with minimum (r = 0.752), maximum temperature (r = 0.788) and relative humidity during *Kharif* 2018. Findings of this study helps in understanding the population dynamics of fruits flies in bitter gourd and developing forewarning strategies to combact the pest in advance.

Keywords: Bitter gourd, fruit fly, incidence, cuelure, methyl eugenol

Introduction
Bitter gourd is an important cucurbitaceous vegetable grown in India. Each part of this crop has been reported useful having some specific medicinal value (Allwood and Drew, 1996) [1]. Fruit flies are important insect pests of fruits, vegetables and other ornamental plants (Bharathi *et al.*, 2004) [5]. Melon fruit fly, *Bactrocera cucurbitae* (Coq.) (Diptera: Tephritidae) is one of the main tropical fruit fly causing considerable damage in cucurbits. *B. cucurbitae* has been observed to infest a wide range of crops in the Cucurbitaceous family. Infestation by melon fruit fly in bitter gourd was reported from 41 to 89 per cent (Rabindranath and Pillai, 1986). Melon fruit fly infests 95 percent of bitter gourd fruits in Papua New Guinea, 90 per cent snake gourd and 60 to 87 per cent pumpkin fruits in Solomon Island while 31.27 per cent in India, respectively (Hollingsworth *et. al*., 1997; Singh *et. al*., 2000) [9, 10]. Yield loss varies from 30–100% (Nath and Bhusan 2006) [2]. It is very much difficult to manage the pest through the application of chemical pesticides due to their peculiar biological features.
Among the various, alternate strategies available for the management of fruit flies, the use of male attractant traps stands as the most outstanding alternative. Various parapheromones are known which are used against fruit flies. Monitoring of pest population round the year is one of the most important basic information in formulating Integrated Pest Management concept for sustainable agriculture. The Cuelure traps have been reported to attract *Bactrocera cucurbitae* males and this sex attractant is more effective than food lure (Pawar *et. al*., 1991, Liu and Lin, 1993; Zaman, 1995) [3, 8, 4]. Keeping in view, present investigation was undertaken to study the population dynamics of fruit flies and its relation with weather factors.

Materials and Method
The study was conducted at the Agricultural Research Farm of Acharya Narendra Dev University of Agriculture and Technology, Kumarganj Ayodhya, India (26.54°N, 81.93°E). The seasonal incidence of fruit flies was monitored at weekly intervals in the cropping season 2018–2019. Cuelure and methyl eugenol baited bottle traps were used for the monitoring of population. The traps used for monitoring fruit flies consisted of a one-litre plastic mineral water bottle (10 cm base diameter and 25 cm in height) with a screw lid.

J. Exp. Zool. India Vol. 25, No. 1, pp. 553-556, 2022 | www.connectjournals.com/jez | *ISSN 0972-0030*
DocID: https://connectjournals.com/03895.2022.25.553 | eISSN 0976-1780

POPULATION DYNAMICS OF GRAM POD BORER, *HELICOVERPA ARMIGERA* (HÜBNER) IN RELATION TO ABIOTIC FACTORS ON CHICKPEA

Nitish Kumar Alok, Sameer Kumar Singh* and Umesh Chandra

Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - 224 229, India.
*e-mail: skbhu1991@gmail.com

(Received 10 September 2021, Accepted 18 November 2021)

ABSTRACT : A field investigation was conducted on the population dynamics of *Helicoverpa armigera* (Hübner) in chickpea during *Rabi* 2020-21. The results revealed that the infestation of gram pod borer started at 46th SMW with a mean population of 0.22 larvae/mrl and attained ETL at 48th SMW with 1.00 larvae/mrl. The peak appearance was recorded during 8th SMW with an average population of 8.80 larvae/mrl and it persisted up to 15th SMW with 0.40 larvae/mrl. The larvae population of H. armigera correlated with abiotic parameters and data revealed a negative non-significant correlation with maximum and minimum temperatures (r= -0.337 and r= -0.321, respectively), however, it showed a positive correlation with relative humidity in the morning which was non-significant and with evening relative humidity, it was significant (r= 0.296 and r = 0.496*, respectively) and there was no rainfall observed during the cropping season. Wind speed and sunshine hours also showed a positive non-significant correlation (r = 0.115 and r = 0.320) with the larval population.

Key words : Population dynamics, abiotic factors, gram pod borer, *Helicoverpa armigera*.

How to cite : Nitish Kumar Alok, Sameer Kumar Singh and Umesh Chandra (2022) Population dynamics of gram pod borer, *Helicoverpa armigera* (Hübner) in relation to abiotic factors on chickpea. *J. Exp. Zool. India* **25**, 553-556. DocID: https://connectjournals.com/03895.2022.25.553

INTRODUCTION

The chickpea is the third most important crop after dry bean (*Phseolus vulgaris*) and pea (*Pisum sativum*). In India, chickpea is considered as King Pulses due to its high nutritional values and demand (Bhatt and Patel, 2001). It is a major supplement of protein (19g), calories 364 g), carbohydrate (61g), iron (34%), magnesium (28%) Vitamin B_6 (25%), vitamin C (6%) and contain various amino acids and medicinal properties (Anonymous, 2018) *i.e.* useful for stomach ailments, blood purifier and lowering of cholesterol (Bhargava, 2020). It has a high ability to fix more than 80 per cent atmospheric nitrogen in soil with help of symbiotic bacteria *Rhizobium* spp. (Baldev *et al*, 1998).

Globally, chickpea is grown about 10.70 million hectares with an average annual production of 9.00 metric tons. India leads the first rank in the area and production of chickpea. In India, chickpea occupies a 7.89-Million-hectare area and producing 7.06 Metric tons with 895 kg/ha productivity. Madhya Pradesh ranks highest in chickpea production (32.37%) followed by Rajasthan (19.46%), Maharashtra (15.82%), Andhra Pradesh (8.76%) and Uttar Pradesh (6.45%) these states contributing 82 per cent of the total production of the country. *Helicoverpa armigera* (Hübner) usually knows as gram pod borer, is one of the most important constraints of legume production. It has a wide host range due to its polyphagous nature and its feed on more than 250 crop species. The favourable weather conditions with frequent cloudy days during crop season that accounts for about 45 per cent to 95 per cent of damage caused by this pest (Sachan and Katti, 1994). Keeping these points in mind, above study was conducted to find the role of abiotic factors on the incidence of gram pod borer in chickpea.

MATERIALS AND METHODS

A field experiment was conducted at the Student's Instructional Farm (SIF), Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.) during *Rabi* 2020-21 on chickpea variety PUSA-262. The estimation of *H. armigera* larvae population was done under field condition in the plot size kept 10×10m with border 0.75m and row to row spacing kept 30cm and plant to plant spacing kept 10cm. The

Journal homepage: https://www.environcj.in/

Environment Conservation Journal
ISSN 0972-3099 (Print) 2278-5124 (Online)

Bioefficacy and economics of certain new molecule of insecticides against Gram pod borer, *Helicoverpa armigera* (Hübner) in chickpea

Nitish Kumar Alok
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya , Uttar Pradesh, India.
Sameer Kumar Singh✉
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - ttar Pradesh, India.
Umesh Chandra
Department of Entomology, College of Agriculture, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya - Uttar Pradesh, India.

ARTICLE INFO
Received : 24 December 2021
Revised : 10 March 2022
Accepted : 20 March 2022

Available online: 2022

Key Words:
Bioefficacy
Chickpea
Gram pod borer
Helicoverpa armigera
Insecticides

ABSTRACT

Gram pod borer (Helicoverpa armigera) is a major insect pest of chickpea. The gram pod borer begins to infest at vegetative stage and later feeds on flowers and developing pods. A field investigation was conducted to evaluate the bioefficacy of certain new molecule insecticides against *Helicoverpa armigera* (Hübner) on chickpea during *Rabi* 2020-21 in randomized block design with three replications. The outcomes revealed that the application of Chlorantraniliprole 18.5% SC @ 25g a.i./ha and Cyantraniliprole 10.26% OD @ 60g a.i./ha were established to be most effective treatments and application of Fipronil 5% SC @ 50g a.i./ha was least effective in respect of reduction of *H. armigera* larval population. The maximum yield was recorded in Chlorantraniliprole 18.5% SC @ 25g a.i./ha (14.00 q/ha) followed by Cyantraniliprole 10.26% OD @ 60g a.i./ha (13.73 q/ha) and lowest yield was recorded from Novaluron 75g a.i./ha (10.15 q/ha) treated plot. The economics of different new molecule insecticides indicated that higher benefit cost ratio (BCR) was observed from Lambda Cyhalothrin 30g a.i./ha (7.86:1) followed by Emamectin benzoate 12g a.i/ha (6.75:1) and the lower BCR was recorded from Cyantraniliprole 60g a.i./ha (1.64:1) and Novaluron 75g a.i./ha (1.58:1). Chlorantraniliprole and Cyantraniliprole are newer group of insecticides, which are relatively safer and more effective against gram pod borer as comparison to conventional insecticides and can be used in successful management of this key pest of chickpea.

GALLEY PROOF

Introduction

Pulses are dry seeds of plants which belongs to Leguminosae family. Pulses are source of protein, amino acids and have other medicinal properties. Production and consumption of higher amount of pulses are the best way to overcome spread of protein malnutrition in world. In 2016, United Nations General Assembly (UNGA) celebrated as International Year of Pulses (IYP) to generate awareness in food security and several benefits of protein and also about sustainable foods production for small holder farmers (Anonymous, 2016). In India over dozens of pulse crops grown, however Chickpea (*Cicer arietinum* L.) is the third most important pulses crop after dry beans and field pea. It is commonly known as Bengal gram, chana or gram, originated from South Western Asia. It is an important *Rabi* pulse crop of India, and considered as 'King of Pulses' due to its nutritional values and high demand (Bhatt and Patel, 2001). Chickpea highly fix more than 80 per cent of atmospheric nitrogen in association with *Rhizobium* spp. India leads top rank in area and production of chickpea. In India, chickpea occupies 107.21 lakh hectare area and producing 9.02 million tons with 895

Corresponding author E-mail: *skbhu1991@gmail.com*
Doi: https://doi.org/10.36953/ECJ.xxxxx
This work is licensed under Attribution-Non Commercial 4.0 International (CC BY-NC 4.0)
© ASEA

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 975-980 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

POPULATION DYNAMICS OF MAJOR INSECT-PESTS AND THEIR NATURAL ENEMIES ON OKRA (*ABELMOSCHUS ESCULENTUS* L.) CROP IN FAIZABAD (UP)

Abhishek Kumar Chaudhary[1], P.K. Gupta[1], Umesh Chandra[1], Chandan Kumar Singh[2] Rahul Kumar Singh[3], *Dharmendra Singh[2] and Vikas Kumar Singh[2]

[1]*Deptt. of Entomology,* [2]*Deptt. of Pathology,* [3]*Deptt. of Extension Education, N.D.U.A. & T., Faizabad -224229, India*

***E-mail :** dmdm3780@gmail.com

ABSTRACT

The present field experiment was conducted during kharif season of year 2013 and 2014 at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India to study the population dynamics of okra insect-pests and their natural enemies. The result revealed that major insect-pests and their natural enemies in Okra started from 2nd and 3rd week of August on 4-5 week-old plant-5 s and continued until fourth week of December on 25-week-old plant-5 s.. Investigations on Population dynamics of major insect-pests and their natural enemies on Okra revealed association of a total 12 arthropods with this crop. Among these seven viz- whitefly (*Bemisia tabaci*), jassid *Amrasca biguttula* (Dist.), Thrips *Thrips tabaci* (Lind.), Fruit borer *Helicoverpa armigera* (Hb.), okra shoot and fruit borer *Earias vittella* (Fabricius), aphid, *Aphis gossypii* (Glov.), and leaf hopper, *Amrasca devastans*. Five viz- lady bird beetle Coccinelia septumpuntata and *Cheilomenes undecimpuntata* Linn.,) and predatory spider *Oxypus* spp. Green Lace wing *Chrysoperla Carnea* (Stephens) Mrid bug and Ants were recorded as natural enemies associated with this crop. The appearance of the major insect pests from 31th SW observed to 50 SW during *Kharif* 2013 and *Kharif* 2014 0.57 leaf hopper /plants at 30th SW during *Kharif* 2015 respectively.

Key words : *Whitefly, Jassid, Thrips, Fruit borer, Okra shoot and fruit borer Earias vittella aphid, and leaf hopper.*

The okra, *Abelmoschus esculentus* L. (Malvaceae) is an important vegetable of India and eaten by people with a great interest. The okra crop is infested by a number of insect pests like *Amrasca devastans, Earias vittella, Bemisia tabaci, Helicoverpa armigera, Acrocercops bifasciata, Thrips tabaci, Aphis gossypii, Podagrica, Aniomisflava, Sylepta derogata, Haritalodes dervgata, Dysdercus koengii* and *Nezara viridula*. But *Amrasca devastans, E. vittela, H. armigera* and *B. tabaci*, are the notorious and major insect pests of okra (Dubey *et al.*, 1999; Basu, 1995; Lohar, 2001). Insect pest infestation not only reduce the growth but also transmit pathogenic diseases (Sheedi, 1980; Dhaliwal *et al.*, 1981). This challenging situation invites attention of entomologists to concentrate energies on integrated pest management (IPM) of okra and other crops (Huffaker and Carl, 1980; Dhaliwal *et al.*, 1981; Mahadevan and Chelliah, 1986; Dubey *et al.*, 1999; Kumawat *et al.*, 2000) Botanical insecticides (Neem oil or biosal and tobacco extracts), microbial control (Bacillusthuringiensis) and biological control agents (spider, ant, lady bird beetle, Orius, myrid bug, Laius, Chrysoperla, Trichogramma etc.) should be integrated for economic management of insect pests (Arora, *et al.*, 1996; Abro et al., 2004; Memon et al., 2004).

MATERIALS AND METHODS

The experiment was conducted at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the plot size 600m^2 following recommended practices during Kharif 2013 and 2014. Date of sowing- 12th July 2013 and 16th July 2014. The okra (cv. Arka Anamika) was sown in well prepared soil on ridges. The distance between row to row was 60 cm, and plant-5 to plant-5 45cm. The seed rate was 8 kg per acre. Observations were recorded on five randomly selected plant-5 s at weekly intervals starting with 14 days after sowing (DAS) till harvesting in terms of number of arthropods, per plant-5 using rectangular cage 45cm long, 30cm wide and 90cm high, according to the stage of crop at Student Structional Form, between 5-7 A.M. Larval population of shoot & fruit borer and fruit borer was recorded at weekly intervals on 5 randomly selected plant-5 s starting with 50 % flowering till harvest. The data of the treatments were recorded at weekly intervals. While recording the data, it was noted that the observations on insect pests and predators should be recorded early in the morning because of flying and moving of these creatures. The observations were recorded through tagging 5 plant-5 s selected at random in each treatment. The populations of sucking insect complex were recorded as per leaf, from five leaves by selecting one from top, 2 from middle and 2 from bottom portion of plant-5, while the population of chewing insect pests and predators were recorded as per plant-5. The pre-treatment observations were recorded before employing plant-5 protection tactics, while post-treatment observations were recorded 48 hours after application of the respective bio-rational pesticide. Weekly Meteorological data during crop was collected from Agro meteorological observatory N. D. University Agriculture

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(2): 1271-1273
© 2018 JEZS
Received: 09-01-2018
Accepted: 10-02-2018

Singh Devendra
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Gupta PK
Professor & Head, Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Chandra Umesh
Assistant Professor, Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj Faizabad, Uttar Pradesh, India

Vikrant
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Kumar Akshay
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Correspondence
Singh Devendra
Ph.D. Scholar Department of Entomology, C S Azad University of Agriculture and Technology, Knapur, Uttar Pradesh, India

Efficacy of insecticides on yellow stem borer, *Scirpophaga incertulas* in rice crop

Singh Devendra, Gupta PK, Chandra Umesh, Vikrant and Kumar Akshay

Abstract
An experiment was conducting during *kharif*, 2013 at Main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) to evaluate the efficacy of some insecticides at different doses against the yellow stem borer *scirpophaga incertulas* (Walker) in rice ecosystem. The application of insecticides was done after transplanting, when the pest population reached at their ETL (Economic threshold level). The result shows that among all the insecticides (treatments), profenofos 40 + cypermethrin 4 (44 EC) 880 gm a.i. was most effective against the yellow stem borer, *scirpophaga incertulas* (Walker) (1.25 per cent) followed by profenofos 40 + cypermethrin 4 (44 EC) 440 gm a.i. (1.75 per cent) and conversely protected the crop. The least efficacy of treatment was found in lambda cyhalothrin 5 EC (3.75 per cent) treated plots. All the treatments were found effective and significantly superior over the control.

Keywords: transplanting, pest, population, ETL, efficacy, insecticides, *scirpophaga incertulas*, profenofos, lambda cyhalothrin

1. Introduction
Rice (*Oryza sativa* L.) is one of the most important staple food crop of Asia and a primary stable diet of over half of the world population relying on rice as the major daily source of calories and protein [4]. Asia accounts for about 90% of the world's rice area and production. Among the rice growing countries, India has the largest area under rice in the world (about 44.6 mha) i.e. 28% of the world's area of production, and ranks second next to China. The share of India to the world's production is near about 22.1 percent [2]. Uttar Pradesh contributes 56.57 lakh ha area and 119.92 lakh ton production with productivity of 2.12 t/ha in comparison to Punjab with maximum productivity (3.82 t/ha) of rice in India [1]. Rice yield in south and south-east Asia fluctuate yearly and adverse only about 2 tonnes/ha or less. The two major factors responsible for poor yield are adverse weather (flood, drought, typhoons etc.) and pest epidemic. Present investigation on yellow stem borer *scirpophaga incertulas* (Walker) of paddy was conducted during *kharif*, 2013 at the main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) to estimate the effectiveness of insecticides against yellow stem borer. The rice plant is subjected to attack by more than 100 species of insects, 20 of them can cause economic damage. Together they infest all parts of the plant at all growth stages, and a few transmit viral diseases [5]. Rice yellow stem borer (YSB), *Scirpophaga incertulas* (Walker) of national importance as their incidence has significant impact on rice yields across the diverse rice ecosystems.

2. Materials and Methods
The experiment was conducted during the kharif of 2013, at Main Experimental Station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224 229 (U.P.) in a Randomized Block Design (RBD) with eight treatments and four replications in plot size measuring 11 x 5 sqm. The treatments were *viz.*, Profenofos 40%+ Cypermethrin4% (44) EC @ 220 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 330 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 440 (g./ha.), Profenofos 40%+ Cypermethrin4% (44) EC @ 880 (g./ha.), Profenofos 50 EC, Cypermethrin 10EC and Lamda cyhalothrin 5 EC including an untreated or control against yellow stem borer *Scirpophaga incertulas* (Walker). The insecticides were applied as and when the pest population reached at their ETL (Economic threshold level) with their respective doses as mentioned in Table-1.

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering
MULTILOGIC IN SCIENCE ISSN 2277-7601

EFFECT OF INSECT POLLINATORS ON SEED YIELD ATTRIBUTING PARAMETERS OF PIGEON PEA CROP

R.K.Verma,RVSingh, Umesh Chandra,Ramveer,M.P Gautam
Department of Entomology
N.D. University of Agriculture and Technology Kumarganj, Faizabad

Abstract

The present investigation entitled "Effect of insect pollinators on seed yield attributing parameters of pigeon pea crop" at Farm of Main Experiment Station of N.D.U.A.T, Kumarganj, Faizabad during *kharif* 2014-15. The result revealed that the maximum pod setting 171 pod/plant and 90.43 per cent seed setting were recorded in open-pollination followed by bee-pollination with 161 pod/plant and minimum pod setting 124.53 pod/plant and 76.96 per cent seed setting in self-pollination. The highest seed yield 19.60 q/ha which was 40.30% increased over on self-pollination was observed in Open-pollination followed by 18.33 q/ha seed yield in Bee-pollination and minimum in self-pollinated pollination with 13.97 q/ha.

Key word: pollinators, seed, pod , insect, flowers and pigeon pea,

Introduction

Predominantly pigeon pea flowers are self-fertilized with 20-40% cross-fertilization so it is known as often cross-pollinated crop. *Cajanus cajan* flowers have bright corollae and produce nectar and pollen. These traits suggest that *C. cajan* would be attractive and possibly bee pollinated by bees (Grewal et al., 1990; Saxena et al., 1990; Reddy et al., 2004 and Sarah et al.2010).

Globally, yields of insect-pollinated crops are often managed for greater pollination through the addition of honey bees (*Apis mellifera* L.) as an agricultural input. Therefore, the potential impact of wild pollinator decline on crop yields is largely unknown. Nor is it known whether increasing application of honey bees compensates for losses of wild pollinators. The effects of evenness on pollination services remain largely unknown, and the impact of wild insect loss on fruit set has not been evaluated globally for insect-pollinated crops.

Materials and Methods

Pigeon pea variety (Narendra Arhar -1) was sown in *kharif* 2014-15 season in the month of June (30-06-2015) and crop was harvested on 25-4-2016 at Main Experiment Station of Narendra Deva University of Agriculture and Technology Kumarganj, Faizabad. All the recommended agronomical practices were adapted to get a good crop in the field.

1. The pigeon pea (Narendra Arhar-1) harvested for sampling and recording the observations of the experiment. The following Seed yield attributing characters were worked out viz.;

(a) Number of pods per plant
(b) Per cent seed setting = No. of developed seed in pod ÷ No. of locals in pod × 100
(c) Weight of grain per plot ($6m^2$) and ha^{-1}.

Results and Discussion

Number of pods

The significant effect of insect pollinators on the pod formation was observed between different treatments. The highest pod formation 171.26 pods /plant was recorded in treatment T_2 (Open-pollination) which was higher as compared to pod formation in treatment T_3 (Bee-pollination) with 161.43 pods /plant and 124.53 pods /plant in treatment T_1 (Self-pollination.

The significantly maximum pod setting, 171pod/plant was recorded in open-pollination followed by 161 pod/plant in bee- pollination and minimum pod set 124 pods/plant was recorded from self-pollination. Pando et al. (2011) recorded *Chalicodoma cincta cincta* foraging resulted to a significant increase of the fruiting rate by 19.65%, as well as the number of pod/plant by 24.33%. Singh et al. (2013) recorded significantly positive effect of bee pollination on reproductive parameters in open pollinated plants i.e. pod setting, number of seeds and seed weight increased by 35.71, 39.14 and 32.88 per cent in cross-pollinated (unbagged) plant in comparison to self-pollinated (bagged) plant. Anonymous (2014-15) also found maximum pods setting in open- pollinated crop followed by bee-pollination and self-pollination.

2. Per cent seed setting:

A glance of data depicted in Table 1 revealed that there was significant effect of insect pollinators on the seed setting of pigeonpea crop between treatments. The maximum seed setting 90.43 per cent was recorded in treatment T_2 (Open pollination) which was significantly higher as compared to seed setting in treatment T_3 (Bee pollination) which was 87.52 per cent and 76.96 per cent in treatment T_1 (Self-pollination).

The significantly maximum seed setting, 90.43 per cent was recorded in open-pollination followed by 87.52 per cent in bee-pollination and minimum seed set 76.96 per cent was recorded from self-pollination. Fohouo et al. (2014) recorded the foraging activity of *X. olivacea* resulted in a significant increase in the Fruit by 22.26%, as well as the number of seeds/pod by 34.98% Placing *X. olivacea* nests close to *C. cajan* fields is recommended to increase seed setting in Cameroon. Rathi and Sihag (1993) recorded plots caged with *C. lanata* showed increases in seed numbers and weight compared with open-pollinated crops. Values for plots caged without bees were significantly reduced. Mazi et al. (2014) reported the fruiting rate, the number of seeds per fruit and the percentage of normal seeds of unprotected flowers in *C.cajan* were significantly higher than those of flowers protected from insects.

3. Average seed yield in q /ha:

The significant effect of insect pollinators on the seed yield was observed between treatments. The highest seed yield 19.60 q/ha was observed in treatment T_2 (Open-pollination) followed by 18.33 q/ha seed yield in treatment T_3 (Bee-pollination) and 13.97 q/ha in treatment T_1 (Self-pollination).

The significant effect of insect pollination on the seed yield was observed between treatments. The highest seed yield 19.60 q/ha was observed in treatment T_2 (Open-pollination) followed by 18.33 q/ha seed yield in treatment T_3 (Bee-pollination) and 13.97 q/ha in treatment T_1 (Self-pollination). This result is in close agreement with Brar et al. (1992) recorded pods/plant and seed yields were similar on plots caged with *A. mellifera* and those caged without bees, but pods/plant and seed yields values were 3 and 4 times greater, respectively, on open-pollinated plots. Anonymous (2014-15) also found maximum yield in open- pollination followed by bee-pollination and self-pollination.

Table-1 Effect of Insect Pollination on seed yield attributing parameters of pigeonpea crop

Treatment	Mean of Seed Yield attributing parameter				Increase over on SP in per cent
	No. of Pod per plant	Seed setting per cent	Kg/plot (6 m^2)	q/ha	
Self-Pollination (SP)	124.53	76.96	0.83	13.97	-
Open-Pollination (OP)	171.26	90.43	1.17	19.60	40.30
Bee-Pollination (BP)	161.43	87.52	1.09	18.33	31.20

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 2307-2308

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2307-2308
Received: 08-01-2018
Accepted: 09-02-2018

MP Gautam
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Umesh Chandra
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

SN Singh
Subject Matter Specialist, KVK Sohawa, Siddharthnagar, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Ramveer
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Ramesh Jaiswal
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

SK Yadav
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Correspondence
MP Gautam
Department Of Entomology, Narendra Deva University of Agriculture and Technology, Faizabad, U.P, India

Correlation between *Helicoverpa armigera* (Hubner) population and Weather factors in chickpea (*Cecer aratinum* L.)

MP Gautam, Umesh Chandra, SN Singh, Ramveer, Ramesh Jaiswal and SK Yadav

Abstract
The present investigations entitled "Studies on population dynamics and management of *Helicoverpa armigera* (Hubner) on chickpea using botanicals" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2016. revealed that *Helicoverpa armigera* population were noticed for the first time during 46th SW of 2016 and respective mean population were 0.33 larvae/plant. Mean population of *Helicoverpa armigera* showed non-significant negative correlation with minimum (-0.335) and maximum temperature (-0.220) and rainfall (-0.266) while RH showed non-significant with positive correlation (0.394).

Keywords: Gram, *Helicoverpa armigera*, Correlation and Weather Factor

1. Introduction

Chickpea (*Cicer arietinum* Linn. Leguminacae) is one of the most important *rabi* pulse crop of India. The world area of chickpea is estimated to be about 135.40 lakh ha^{-1} at global level with production and productivity of 131.02 lakh tonnes and 968 kg ha^{-1} respectively. In India, the area, production and productivity 59 mha, 77.03 million tonnes and 890 kg ha^{-1}, respectively (Annonymous 2016) [1].

Gram Pod borer *Helicoverpa armigera* is one of the major pest of gram. The pest starts its attack at early stage and become severe during maturity stage of the crop. The pest accounts for 90-95% of total damage. A single larva of *Helicoverpa armigera* can damage 25-30 pods of gram in its life time. It feeds on tender shoots and young pods. It makes holes in pods and insert its half body inside the pod to eat the developing seeds. The pod borers inflict heavy crop losses from seedling to maturity and the losses reach at its peak when the pods appear. The seed yield losses due to *Helicoverpa armigera* were 75-90% and in some places the losses were up to 100%. The yield loss in chickpea due to pod borer was reported as 10 to 60 per cent in normal weather conditions, while it was 50 to 100 per cent in favorable weather conditions, particularly in the state where frequent rain and cloudy weather is prevailing during the crop season. These losses can be reduced by the application of insecticides. In favorable conditions pod borer may cause 90-95 per cent of pod damage (Kumar *et al.*, 2017).

Helicoverpa armigera is a conundrum and one of the most dominant insect pests in agriculture, accounting for half of the total insecticides usage in India for protection of crops. The problem of this pest is magnified due to its direct attack on fruiting structures, voracious feeding habits, high mobility and fecundity, multivoltine nature, overlapping generations, nocturnal behavior etc., (Sarode, 1999) [7]. At the same time adequate ecological data is prerequisite for integrated pest management, which can therefore be enhanced after determining the seasonal abundance (Mathur *et al.*, 2003) [5]. There are many environmental factors which influence the insect pest populations (Lode and Sharma, 1993) [3]. Among them abiotic factors play a vital role in multiplication and distribution of insect pests.

Method and Material

To know the effect of abiotic variables on the population of *Helicoverpa armigera*, simple correlation analysis was carried out. The result of the analysis has been presented in (Table-2) and details have been given here as below:

Correlation observed between the *Helicoverpa armigera* population and abiotic parameters showed non-significant positive correlation with minimum and maximum temperature, relative humidity while rainfall had non-significant negative correlation.

Journal of Pharmacognosy and Phytochemistry 2019; 8(4): 599-601

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(4): 599-601
Received: 10-05-2019
Accepted: 12-06-2019

RK Yadav
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

U Chandra
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Ram Veer
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Amit Raj
Department of Entomology, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

CPN Gautam
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Sachin Kumar
Department of Entomology, C.S.A. University of Agriculture and Technology, Kanpur, Uttar Pradesh, India

Gajendra Singh
Department of Entomology, S. V. B. P. University of Agriculture and Technology, Meerut, Uttar Pradesh, India

Correspondence
RK Yadav
Department of Entomology, N.D. University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Relative efficacy of newer insecticides against gram pod borer, *Helicoverpa armigera*

RK Yadav, U Chandra, Ram Veer, Amit Raj, CPN Gautam, Sachin Kumar and Gajendra Singh

Abstract
The experiment was conducted at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during Rabi season 2015-16. Studied on Emamectin benzoate 5 SG @ 11 g a.i./ha was found most effective insecticide (94.44%) to reduce the larval population, it was followed by flubendiamide 480 SC @ 30 g a.i./ha that gave 87.78 per cent reduction, which was at par with rynaxypyr 20SC @ 40 g a.i./ha (83.33%). Least effective treatment was Lufenuron 50EC @ 60 g a.i./ha. in which only 64.44 percent reduction in larval population was registered. Reduction in larval population computed from data recorded 14 days after spraying revealed that all the treatments were effective and significantly superior to control. Emamectin benzoate 5 SG @ 11 g a.i.//ha was found most effective that reduced 100.00 per cent larval population.
Emamectin benzoate 5 SG @ 11 g a.i.//ha treated plots gave maximum grain yield (18.00 q/ha), it was at par with flubendiamide 480 SC @ 30 a.i./ha and Rynaxypyr 20SC @ 40 g a.i./ha in which 17.00, 16.50 q/ha grain yield, respectively were recorded. Maximum cost- benefit ratio was obtained in plot treated with flubendiamide 480 SC @ 30 g a.i./ha (1:10.06) followed by emamectin benzoate 5 SG @ 11 g a.i.//ha (1:9.20). Lowest cost -benefit ratio (1:3.10) was found in Lufenuron 50 EC@ 60 g a.i./ha treated plot.

Keywords: Pod borer, management, cost benefit, treatments and insecticides

Introduction
Chickpea, *Cicer arietinum* L. belongs to family Papilionaceate is an important pulse crop grown in many parts of the world. It is an important source of protein in human diet and animal feed (Khoso, 1992) [2]. The split grain of chickpea is called dal which is an excellent source of high quality proteins, essential amino and fatty acids, fibres, minerals and vitamins.
The area under chickpea cultivation in India is about 9.51 m ha with production of 8.83 m tonnes and productivity 929 kg/ ha. The area under U.P. is 0.0604 m ha with production of about 0.0732 m tonnes with an average yield of 1212 kg/ha (Anonymous, 2013-14) [1].
The chickpea pod borer, *Helicoverpa armigera* is polyphagous in nature which causes damage to several crops such as pigeon-pea, groundnut, cotton, vegetables, pearl millets, sorghum, maize, sunflower etc.
The young larvae often feed upon the tender foliage before attacking the pods by causing heavy losses to crop and sometimes whole crop failed due to severe infestation (Lohar and Rahoo, 1993; Nizamani, 1998) [3, 4]. Damage potential of this pest is so great that an average infestation of single larva may destroy 30-40 pods per plant in chickpea. The extent of losses in chickpea by pod borer varies from region to region. On chickpea, the pest appears in late February and reaches its peak by the end of April. Since not much resistance is available in gram genotype against the pest, therefore, farmers are increasingly relying on synthetic insecticides to manage this pest on different crops.
The pest feeds voraciously from seedling stage to maturity and causes about 50 to 60 per cent damage to the chickpea pods (Khare and Ujagir, 1977) [5]. In India, losses caused by pod borer on chickpea and pigeon pea fields exceeded Rs. 12,000 million per year (Anonymous, 1996) [6].
To control this insect pest number of chemical insecticides is used injudiciously which resulted development of resistance in insect, secondary pest outbreaks, threat to their natural enemies and residual effect on environment. In order to develop pest management strategies of *H. armigera*, knowledge on the basic biology of this pest is required. Jadhav and Suryawanshi, (1998) [7] reported that the application of insecticides reduced the larval population of pod borer on chickpea crop to a considerable extent and hence increased the yield. Balasubramanian *et al* (2001) [8] reported that chlorpyrifos 20 EC was the most effective insecticide to control gram pod borer.

Journal of Entomology and Zoology Studies 2018; 6(4): 1633-1636

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(4): 1633-1636
© 2018 JEZS
Received: 06-05-2018
Accepted: 07-06-2018

Ramesh Jaiswal
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Umesh Chandra
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

MP Gautam
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

SK Yadav
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

SK Giri
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Ramveer
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Correspondence
Ramesh Jaiswal
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Study on availability of bee flora and foraging activities of honey bee in Eastern Uttar Pradesh

Ramesh Jaiswal, Umesh Chandra, MP Gautam, SK Yadav, SK Giri and Ramveer

Abstract
The present investigation entitled "study on availability of bee flora and its foraging activities in eastern Uttar Pradesh", was carried out on the honeybee foraging activities were recorded on different agricultural and horticulture crops during *Rabi* season 2016-17. It was observed that the bee-flora consists of mostly, fruits and agriculture crops like spices, pulses, cereals, oil seed/yielding, fiber, and fodder crops etc. *Brassica rapa* were the major agricultural bee crops of the area with flowering period of three (3) and four (4) months respectively. These plants species served as the excellent sources of pollen and nectar in the study area. The result revealed that 10 crops were useful to honeybees, out of which 5 crops were agricultural crops like as Mustard, pigeon pea, gram, bakla etc. and 4 horticulture crops like as mango, lemon, guava, anola and the forest plant like as eucalyptus, which are well distributed and commonly found in the study area. The identified flora was further grouped into pollen, nectar and both pollen and nectar yielding plants out of 5 agricultural bee crops, three (3) plants were nectar yielding, one (1) pollen yielding and six (6) plants species were both pollen and nectar yielding

Keywords: Honeybee, *Apis mellifera*, bee flora and foraging activities etc.

1. Introduction

Flowers are the mainstay of the bee's life. From flowers,, they obtain pollen, the protein rich food used mostly to feed the carbohydrate fuel for their flight, foraging, hive activity and for rearing brood. The abundance of bee flora and their continuous availability is one of the major pre-requisites for successful beekeeping. This enables the beekeepers to exploit these sources to the maximum utilization by the bees. Every region has its floral dearth periods of short or long duration and it is essential to manage the honey bees and bee hives in the dearth period. As during this period, there is lack of availability of nectar and pollen in flora required for quantitative and qualitative production of honey [1]. To overcome this problem. It is important to find out the suitable bee flora available in the locality to propagate and manage the plant species with a option of abundant nectar and or pollen to overcome the problem during the dearth period for commercial apiculture [4]. The present bee fauna dates back to Cretaceous period which is more that 70 mya. Bees are members of the kingdom Animalia, the phylum Arthropods, the class Insecta and the order Hymenoptera (from the Greek hymen, for membrane, and Petron, for wing) [2]. This order includes over 100,000 diverse species of bees, wasps, ants, and saw flies that have been identified and described. The most important characteristic of most members of this order for the understanding of layman is a "wasp waist" which is narrow area between the thorax and the abdomen. Of course, they also all have two pairs of wings, multi-segmented antennae and a few species have a piercing ovipositor [5].

The floral sources and its blooming period are the main indicators and tools for modem beekeeping in India. The bee plants are grouped into forest plants, horticultural /agricultural plants and pastures and hay fields [9]. In India, 50 million hectares of land is under bee dependent. Bee keeping (or) apiculture is the maintenance of honey bee colonies commonly in hives by humans. A bee keeper/ Apiarist keeps bees in order to gather honey bee wax to pollinate crops (or) to produce bees for sale to other beekeepers. Normally bee keepers use three types of hives for example traditional hives, top bar and langstroth hives. Newton's bee hive model normally adapted by the honey bee keepers [6, 7, 12].

The characteristics of *A. mellifera* combined with the high demand for Honey products put beekeeping as a key activity for ecosystem conservation and economic development, thus

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SEASONAL INCIDENCE FLUCTUATION OF OKRA SHOOT AND FRUIT BORER AND THEIR NATURAL ENEMIES ON BHINDI (*ABELMOSCHUS ESCULENTUS* L.) IN RELATION TO ABIOTIC FACTORS

Umesh Chandra and Abhishek Kumar Chaudhary
Department of Entomology, N.D.U.A. & T., Kumarganj, Faizabad -224229

Abstract

The experiment was conducted during kharif season of year 2014 and 2015 at Student Instructional Form, N. D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) India to study the seasonal incidence fluctuation of okra shoot and fruit borer and their natural enemies on Bhindi. Incidence were recorded with three replication. The result revealed that shoot and fruit borer and their natural enemies in Okra observations started since 33th standard week at 5 week old plants until 50th standard week on maturity, the incidence of okra shoot and fruit borer *Earias vittella* (Fabricius), and their natural enemies lady bird beetle (*Coccinella septumpuntata* and *Cheilomenes undecimpuntata* Linn.,) and predatory spider (Oxypus spp.), Green Lace wing (*Chrysoperla Carnea* Stephens), Mrid bug and ants were recorded as natural enemies associated with this crop. The incidence of the okra shoot and fruit borer 0.41 larvae /plant from 33 th SW observed to 50 SW during Kharif 2014 and 0.34 *Earias vittella* larvae /plants at 32th SW during Kharif 2015 respectively.

Key words: *Earias vittella*, Bhindi, seasonal incidence.

Introduction

Okra (Abelmoschus esculentus L.) belongs to family Malvaceae or Mallow which is locally known as Bhendi and Lady's finger worldwide. It is very popular summer vegetable for home gardening while it is also grown commercially throughout the world especially in Indo Pakistan sub-continent. It is probably originated in Ethiopian region of Africa (Naheed et al., 2013). Okra [Abelmoschus esculentus (L.) Moench] is one of the important vegetable crops grown in India with an area of 532.70 thousand hectares with the production of 6346.40 thousand MT green fruits, whereas the productivity is 11.9 MT /ha. It is commercially grown in the state of Andhra Pradesh, West Bengal, Bihar, Gujarat, Maharashtra, Uttar Pradesh, Odisha, Jharkhand, Chhatishgarh Telangana, Karnataka, Haryana and Punjab etc. However, Uttar Pradesh is covering an area of 12.19 thousand hectare with a production of 148.64 thousand metric tonnes and productivity of 12.2 metric tonnes per hectare (Anonymous, 2015). Aphids and leafhoppers are important sucking pests which de-sap the plants, make them weak and reduce the yields to an extent of 54.04 per cent since incidence occurs during early stage (Choudhary and Dadheech, 1989), while, shoot and fruit borer severely attacks the tender fruits causing nearly 45 per cent direct yield loss in the production of quality fruits (Kumar et al ., 2003) Knowledge on seasonal incidence of different pests of okra at different growth stages of the crop and its relation with weather parameters will be of great help to plan appropriate management strategies of different insect pests. In order to reap maximum yields, it is imperative that the crop should be free from the infestation of pests

Materials and Methods

The experiment was conducted at Student Instructional Form, N. D. University of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the each plot size 4x4 m2 following recommended practices during Kharif 2014 and 2015. Date of sowing- 12th July 2014 and 16th July 2015. The okra (cv. Arka Anamika) was sown in well prepared soil on ridges. The distance between row to row was 60 cm, and plant-5 to plant- 45cm. The seed rate was 8 kg per acre. Observations were recorded on five randomly selected plant-5 s at weekly intervals starting with 14 days after sowing (DAS) till harvesting in terms of number of arthropods, per plant-5 using rectangular cage 45cm long, 30cm wide and 90cm high, according to the stage of crop at Student Structional Form, between 5-7 A.M. Larval population of shoot & fruit borer was recorded at weekly intervals on 5 randomly selected plant-5 s starting with 50 % flowering till harvest. The data of the treatments were recorded at weekly intervals. While recording the data, it was noted that the observations on insect pests and predators should be recorded early in the morning because of flying and moving of these creatures. The observations were recorded through tagging 5 plant-5 s selected at random in each treatment. The populations of natural enemies were recorded as per leaf, from five leaves by selecting one from top, 2 from middle and 2 from bottom portion of plant-5, while the population of chewing insect pests and predators were recorded as per plant-5. Weekly Meteorological data during crop was collected from Agro meteorological observatory N. D. University Agriculture &Technology (Faizabad). Correlation between arthropod Population and abiotic factors was worked out.

Results and Discussion

Insect-pests population: Studies on Population dynamics of major insect-pests and their natural enemies on Okra with this crop in this area. The data presented in reveled that first appearance of Okra shoot and fruit borer (*Earias vittella*) was noticed in the 34th S.W. the larval population ranged from 0.30 to 2.07 larvae/plant of *Earias vittella* in 2014 and 0.43 to 2.04 in 32th in 2015 the maximum population of 2.07 larvae/plant of *Earias vittella* was found in the 41th S.W. during 2014 and 2.04 larvae/plant of *Earias vittella* in 41th in 2015.The data presented in reveled that the first appearance of Okra shoot and fruit borer *Earias insulana* was noticed in the 37th S.W. the larval population ranged from 0.33 to 3.29 larvae/plant of *Earias insulana* in 2014 and 0.14 to 3.93 in 32th in 2015 the maximum population of 3.29 larvae/plant of *Earias insulana* was found in the 37 th S.W. during 2014 and 3.93 larvae/plant of *Earias insulana* in 41th in 2015. Appearance of the the Natural enemies population: The first appearance of lady bird beetle in the 32th S.W. 2014 and 34th in 2015 beetle ranged from 0.33 to 5.35/plant-5 and 1.45 to 6.35 and the maximum population 5.34 was found in the 37th S.W. in 2014and 6.35 beetle /plant-5 in 38th SW in 2015 the first appearance of spider in the 31th S.W. 2014 and 2015 spider ranged from 0.45 to 5.12/plant-5 and 0.33 to 7.98 and the maximum population 5.34 was found in the 37th S.W. in 2014 and 6.35 beetle /plant-5 in 39th SW in 2015. The first appearance of ant in the 32 th S.W. 2014 and 33th in 2015 spider ranged from 0.33 to 3. 63 /plant-5 and 1.54 to 4. 58 and the maximum population 3. 63 was found in the 34th S.W. in 2014 and 4.58 spider /plant-5 in 34th SW in 2015. the first appearance of Green Lace wing in the 35th S.W. 2014 and 33th in 2015 spider ranged from 0.83 to 5.54/plant-5 and 1.25 to 6.51 and the maximum population 5.54 was found in the 38th S.W. in 2014 and 6.51 GLW /plant-5 in 39th SW in 2015. The first appearance of mirid bug in the 34th S.W. 2014 and 37th in 2015 ranged from 0.50 to 3.85/plant-5 and 0.76 to 4.25 and the maximum population 3.85 was found in the 38th S.W. in 2013 and 4.25 mirid bug /plant-5 in 42th SW in 2014. (Shobizai et. al., 2011 Chaudhary et al., 2017) have however reported association of twelve pests (Das et al., 2001) thirty one spp. and eleven and (Bindu et al,. 2003) twelve spp. of insect pests associated with this crop at its various growth stages. in the present study are in accordance with the finding of (Singh et al., 2015). To know the effect of abiotic variable simple correlation analysis was carried out the results of the analysis present in (Table-1&2) revealed that the Positive and significant correlation was observed between population of *E. vittella* with maximum temperature during *Kharif* 2014 and 2015, while positive and non-significant correlation was observed with minimum temperature during *Kharif* 2014 and 2015. However, during *Kharif* 2014 the

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2017; 5(4): 570-572
© 2017 JEZS
Received: 11-05-2017
Accepted: 12-06-2017

SN Satapathy
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Correspondence
SN Satapathy
Department of Entomology, College of Agriculture, Narendra Deva University of Agriculture & Technology, Faizabad, Uttar Pradesh, India

Pollination efficiency of insect pollinators on *Aegle marmelos* Correa. At Kumarganj, Faizabad

SN Satapathy and Umesh Chandra

Abstract
In the present research the variety "Narendra Bael 9 (NB 9)" was taken to study the insect pollinator's abundance and their pollination efficiency at Main Experiment Station (26.47°N latitude, 82.12° E longitude and 113 meters altitude), Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. The hymenopterans were the major floral visitors comprising of six species from four families *viz*., Xylocopidae, Apidae, Vespidae and Formicidae, followed by dipterans (One species from one family) *viz*., Syrphidae, Lepidoptera (three species from two families) *viz*., Pieridae and Arctiidae. The abundance of *Apis dorsata* was highest (7.90 bees/spike/5 minutes) followed by syrphid flies, *Eupeodes corolae* (3.45 visitors/spike/5 minutes) and *Apis mellifera* (1.20 bees/spike/5 minutes). Based on pollination index (Number of loose pollen grains sticking on the body of visitors × abundance), *A. dorsata* was found to be the most efficient pollinator of bael flowers followed by *Eupeodes corolae* and *A. mellifera* under agro-ecological conditions of Kumarganj, Faizabad (India).

Keywords: Abundance, pollinator, pollination efficiency, pollination index, pollen grain, bael

1. Introduction
Bael (*Aegle marmelos* C.) belongs to family rutaceae and it is known in India from pre-historic time [6]. In nature, only about 5 per cent of the flowers are self-pollinated and 95 per cent animal pollinated [5]. Bael is mostly cross pollinated fruit crop which has entomophilous flowers and pollination is carried out by various insect pollinators like honey bees (*Apis dorsata*, A. *mellifera*),hover flies, yellow wasp, carpenter bee, weevil, black ants, butterflies etc. [4]. Bees are the best among all pollinators. Butterflies are occasional pollinators, and do pollination of crops while feeding on nectar from one flower to another. Flies, hoverflies and wasps are effective pollinators because they visit flowers to feed upon nectar (or in some species pollen) for essential nutrients for egg maturation and extending their life-span [2]. Being a cross pollinated crop, its fruit set is expected to be affected by the insect visitors. The investigation was carried out on the pollination efficiency, which is defined as the proportion of pollinated flowers relative to those that experienced pollen removal.
The present studies were conducted with the objectives to know pollinators abundance and pollination efficiency of pollinator species.

2. Materials and Methods
The pollination studies in bael variety, "NB 9" was carried out under sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47° N latitude, 82.12° E longitude and altitude of 113 metres from mean sea level] during 2014.

2.1 Abundance of insect visitors: Abundance (number of visitors/ spike/5 minutes) of major pollinators was recorded from six randomly selected bael plants. These observations were recorded from 6:00 am to 6:00 pm at an interval of 3:00 hours. Observations were recorded for 7 days each after the initiation of 10% flowering in crop, at peak flowering and before the cessation of flowering in the crop.

2.2 Loose pollen grains sticking on the body of insects visitors: For estimating the number of loose pollen grains sticking to the body of major insect pollinator species, the insect pollinators were captured gently by forceps from the flowers to avoid shaking of body and the

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

POPULATION DYNAMICS OF INSECT – PESTS IN SUGARCANE CROP

Shivshankar Singh[1], Umesh Chandra[2] Roopesh Singh[3] Sanjay Singh[4], Sarvesh singh[5]and Abhishek Kumar Chaudhary[6]
1,2,3,6 Department of Entomology, 4 Department of Plant Pathology and
5 Department of Horticulture
NDUA&T, Kumarganj, Faizabad-224229, UP, India.

Abstract

The survey of population dynamics of insect – pests in sugarcane crop with special reference to early shoot borer and top borer carried out during spring season at farmer's field in eastern U.P. Present investigation revealed that five insect- pests prevailed and infested sugarcane crop in these areas. They were shoot borers (*Chilo infuscatellus*), top borer (*Scirpophaga excerptalis*), leaf hopper (*Pyrilla perpusilla*) termites (*Odentotermes obesus*) and grass hopper (*Hieroglyphus spp.*). The maximum infestation (32.22%) of shoot borer was recorded on 20th Standerd week and the minimum infestation (3.33%) on 13th and 28th SW. The highest termite infestation (38.88%) was noticed on 20th SW, whereas the lowest (1.11%) on 12th and 28th SW. The maximum population (4.47 insects/plant) of grass hoppers was noticed from 31st SW and the minimum population (0.13 insects/ plant) on 42nd SW in the field. Sugarcane top borer caused maximum infestation (35.55%) on 32nd SW and minimum (1.11%) on 41st SW.

Keywords- Shoot borer, Top borer, infestation, leaf hoppers

Introduction

Sugarcane (*Saccharum officinarum* L.) is one of the major sugar-producing crop that contributes nearly 75 per cent to the total sugar pool at global level. It belongs to genus Saccharum and family Poacae. Molasses is an important by- product of sugar industry. It is used for production alcohol by the distilleries. India ranks first in sugarcane production in the world followed by Brazil. The area, production and productivity of sugarcane in India were 5.47 mha, 380 mt and 69.4 t/ha, respectively. Whereas in Uttar Pradesh, sugarcane is grown in about 2.28 mha area with 121.36 mt annual production and 53.23 t/ha productivity (Anonymous 2012).

Among the various constraints in sugarcane production, varieties, fertilizers, irrigation, insect- pests and the disease are prime importance. As many as 200 species of insect- pests have been reported on sugarcane crop (Jaipal and Singh, 2010), however, one dozen are recognized as major pests at various stages of crop growth. The shoot borer, Chilo infuscatellus Snellen and top borer, Scirpophaga excerptalis Walker are more serious pests in the early stage of the crop throughout the country. In Punjab, Haryana and northern Rajasthan the stalk borer, Chilo auricillius Dudgeon is raised as an important pest in recent years (Atwal and Dhaliwal, 2007).

Shoot borer has been reported as serious pest of sugarcane in which the early shoot borer, *Chilo infuscatellus* caused 30 to 75 per cent losses in early stage of the crop in sub-tropical region (Jaipal et al. 2010). The young larvae bore down the spindles by moving upward direction and destroyed the apical meristem. Consequently, the cut off spindle dries up and develops a conspicuous 'dead heart' that can be pulled out easily and emits rancid odour.

Top borer, *Scirpophaga excerptalis* has been considered as the most serious pest of sugarcane which caused 31.94% loss in early and 28.50% loss in mid to late maturing cultivars. It attacks the upper parts of the sugarcane plant. The caterpillars bore into the midrib of leaves and enter into the top portion of the plants (Madan and Singh, 2002).

Materials and Methods

Population dynamics of insect- pests:

Farmer fields were selected to record the population dynamics, Farmer fields were regularly monitored in the morning hours at Sugarcane crop was regularly monitored in the morning hours at weekly intervals to observe the population/infestation of various insect- pests from germination to harvest on 10 randomly selected plants at three locations in each in all the fields.

A. **Borers:**

i. **Shoot borers-**

Number of healthy and infested plant at shoot stage of the cane was recorded by observing the dead hearts and puncture holes on leaf sheath.

i. **Top borer-**

The observations on incidence of top borer was recorded by observing the dead hearts, shoot holes, mined midrib leaves as well as bunchy top on sugarcane clumps.

B. **Root feeders**:

i. Termites-

Number of infested and healthy crop plants.

C. **Sap Feedres:**

i. Grass hopper-

Number of both nymphs and adults on the infested leaves.

ii. Leaf hopper-

Number of both nymphs and adults on upper, middle and lower leaves

Results and Discussion

Only five insects- pests were noticed on sugarcane crop during spring season *viz.*, shoot borers (*Chilo infuscatellus*), termites (*Odentotermes obesus*), top borer (*Scirpophaga excerptalis*), leaf hopper (*Pyrilla perpusilla*) and grasshopper (*Hieroglyphus spp.*) at different growth stages of the crop.

The initiation of shoot borers infestation was noticed on 13th SW (3.33%) and continued up to the 27th SW. The maximum infestation (33.33%) was recorded on 20th SW, and minimum (3.33%) at 27th SW. The initiation of termite infestation was noticed on 13th SW (6.6%) and continued up to the 27th SW. The maximum infestation (43.33%) was recorded on 20th SW and minimum (3.33%) at 27th SW.

Initiation of top borer infestation was started on sugarcane in 25th SW and which was continued up to 41th SW, the maximum infestation (33.33%) was recorded on 32nd SW and minimum (3.33%) at 25th and 40th SW. Grasshopper population was noticed on 13th SW (0.30 insects/plant) and continued up to the 42nd SW. The maximum population (4.60 insects/plant) was noticed on 31th SW and minimum (0.20 insects/plant) at 42th SW.

Initiation of leaf hopper population was noticed on 22nd SW (0.40 insects/plant) and continued up to 41st SW. The maximum population (4.20 insects/plant) was recorded on 35th SW and minimum (0.30 insects/plant) at 41st SW. The results are in conformity with Madan and Chaudhary (1995) observations, who had noticed the population of leaf hopper from January to December with (25.5 insects/plant) highest population in the month September, while lowest (0.1 insects/plant) in March.

References

Abdullah, M. (2009). Incidence of some major insect- pest in sugarcane clones in Bangladesh. *Indian sugar*, 59 (6): 17-26

Anonymous (2012). The Sugar Technology Association of India, pp 1-3.

Atwal, A.S. and Dhaliwal, G.S. (2007). Agricultural pests of South Asia and their management. Kalyani Publishers, Ludhiyana, New Delhi, India. pp. 1-305.

Jaipal, S. and Singh, J. (2010). Integrated insect pest management for low external input sugarcane production. In Producing of the 9th Joint Convention of STAT SISSTA: 109-125.

Jaipal, S. and Singh, D. (2003). Bio- efficacy of imidacloprid and amrutguard against termites and shoot borer in sugarcane crop. *Indian sugar*, 53 (9): 709-716.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3377-3381

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7** pp. 3377-3381
Journal homepage: http://www.ijcmas.com

Original Research Article

Population Dynamics and Management against Budfly *Dasyneura lini* Barnes in Linseed (*Linum usitatissimum* Linn.)

Mohammad Rizwan[2*], Umesh Chandra[1], Rajat Deshwal[2], Mohammad Imran[3], Gajendra Singh[2] and Ankush Kumar[2]

[1]Department of Entomology, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India
[2]Department of Entomology,.Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110, Uttar Pradesh, India
[3]Department of Genetics and Plant Breeding, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110, Uttar Pradesh, India
**Corresponding author*

A B S T R A C T

The population dynamics of budfly *Dasyneura lini* was experimented during rabi season 2012-13 at the Student's Instructional Farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.). The incidence of budfly was recorded on variety Neelum at weekly intervals from germination till the harvest of the crop. There were eight treatments, namely Imidacloprid 17.8 SL @ 0.005%, Nimbicidine 0.25%, NSKE 5%, Neem leaf extract 5%, Green chilli extract 0.5%, Garlic extract 5%, Tulsi leaf extract 5% and Control. While application of Imidacloprid (17.8 SL @ 0.005 %) was found most effective followed by Nimbicidine @ 0.25 %, NSKE @ 5 % was found as the least effective in controlling of bud fly infestation. On the basis of yield, the highest yield was obtained from Imidacloprid 17.8 SL @ 0.005 % (16.22 q ha^{-1}) followed by (14.29 q/ha^{-1}) with Nimbicidine @ 0.25 %. On the basis of overall performance of all the eight treatments Imidacloprid was isolated as the most effective treatment for the control of the linseed budfly.

Keywords

Linseed budfly, population dynamics, Imidacloprid

Introduction

Linseed, (*Linum usitatissimum* Linn.) is one of the oldest oilseed crop known as poor man's crop in India. It has got special importance amongst oilseed crop in rabi and has also been called as 'Alsi', 'Tisi', 'Mosina' and 'Arise' in India. Among all the insect of linseed, budfly is the most important insect and it affect the pods of linseed very drastically leads to reduce the crop yield. The crop is cultivated commercially for flax in the world. In India, Linseed is globally cultivated for oil production, fibers and flax. Fibres are used for the manufacture of linen and the stem yields fibres ,of good quality having high strength and beauty. It is utilized in making the best quality hand kerchiefs, materials of suits and dresses, bedding, napery, hand towels and other decorative articles (Gill, 1987). Every part of the linseed is utilized commercially either directly or after processing. About 80 per cent of the oil goes

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 612-618

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 612-618
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Efficacy of Botanicals against *Helicoverpa armigera* (Hubner) on Chickpea (*Cicer arietinum* L.)

M. P. Gautam[1*], Umesh Chandra[2], S. N. Singh[1], S. K. Yadav[1] and S. K. Giri[1]

[1]Department of Entomology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad-224229 (UP), India

[2]S.M.S. (Agril. Extension), KVK, Masodha, Faizabad-224133 (U.P.), India

Corresponding author

Keywords

Gram, chickpea, botanicals, *Helicoverpa armigera*, insecticide, management, etc.

ABSTRACT

The present investigations entitled "Studies on population dynamics of *Helicoverpa armigera* (Hubner) on chickpea" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2016.All the treatments were found significantly superior over control, indoxacrb (14.5 SC) performed best among the treatments followed by Neem oil. The effectiveness of treatment determined in the terms of grain yield of chickpea obtained in different treatments revealed that the Indoxacarb @ 14.5SC, Neem seed oil @ 5ml and karanj oil @ 5ml were significantly superior over untreated control. Indoxacarb 14.5@ SC, gave maximum grain yield of chickpea in compared to other treatments as well as in managing the population of *H. armigera*. Besides Neem seed oil @ 5ml and karanj oil @ 5 ml were found the second and third most effective treatments respectively

Introduction

Gram (chick pea) is the crop of tropical, subtropical and temperate region and widely grown in Uttar Pradesh, Madhya Pradesh, Punjab, Rajasthan and Maharastra which is popularly used as a protein adjunct to starchy diets. Seeds are widely consumed as pulse and in the form of flour which is largely fed to the horse and eaten after roasting. Seeds of chick pea contain 17.1% proteins, 5.3% fats, 16.2% carbohydrates, 3.9 % fibres and 2.7% minerals. Moderate to high levels of resistance to cypermethrin and moderate resistance to endosulfan were recorded in field populations of *H. armigera*. The growing awareness of the hazards of pesticide use has created a worldwide interest in pest control agents of plant origin that are bioactive and yet ecologically safe. Hence, the present experiment was conducted to assess the performance of Neem Seed Kernel Extract (NSKE) along with safer new molecule Flubendiamide 39.35 SC as an effective combination of oviposition inhibitor and larvicidal effect for the management of *H. armigera* on chickpea.

Pod borer *Helicoverpa armigera* Hubner (Noctuidae: Lepidoptera) is one of the major pest of gram. The pest starts its attack at early stage and become severe during maturity stage of the crop. The pest accounts for 90-95% of total damage. A single larva of *H. armigera* can damage 25-30 pods of

Journal of Entomology and Zoology Studies 2019; 7(1): 1061-1065

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(1): 1061-1065
© 2019 JEZS
Received: 19-11-2018
Accepted: 23-12-2018

Avinash Udikeri
Department of Entomology, College of Agriculture, Faizabad Narendra Deva of University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, College of Agriculture, Faizabad Narendra Deva of University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Avinash Udikeri
Department of Entomology, College of Agriculture, Faizabad Narendra Deva of University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Pollination efficiency of different insects on Phalsa *Grewia subinaequalis* D.C

Avinash Udikeri and Umesh Chandra

Abstract
A field experiment was conducted to evaluate efficiency of different pollinators on Phalsa, *Grewia subinaequalis* D.C. a fruiting shrub at Faizabad (U.P) during 2015. The foraging activity started from April month. *Apis dorsata* found to visit more number of flowers (10.01) in a minute by spending very less time (2.27 sec) per flower. *A. mellifera, Halictus sp., Polistes olivaceus* and *Megachile sp.* found visiting 9.35, 6.27, 4.16 and 3.92 number of flowers in a minute and spent 2.82,6.55,7.89,7.31 seconds on flower respectively. *A. dorsata* appeared to be most efficient pollinator on Phalsa with pollination index of 85066 followed by *Apis mellifera*. Highest fruit setting (59.17%) was recorded in the bee pollinated plants followed by open pollinated plants under Kumarganj agro-ecological conditions.

Keywords: bees, foraging rate, pollination index, phalsa

1. Introduction
Phalsa *Grewia subinaequalis* D.C (Order malvales and family Tiliaceae) an indigenous to India and it is mentioned in vedic books. Shrub is known with different names in East and North India. Phalsa was grown naturally at low elevations in dry zone of island of Luzon. Area of Phalsa is very less in the present world, It is only cultivated for research purpose in some places like former Federal Experiment Station, Mayaguez, Puerto Rico, and the Agricultural Research and Education Center, Homestead, Florida (Morton 1987) [10]. It was introduced into Phillipines in 1914 from India and Presently it is cultivated commercially mainly in the Punjab and around Mumbai. Apart from India it is cultivated in Pakistan, Nepal, Bangladesh, Laos, Sri Lanka, Thailand, Philippines, Vietnam and experimental basis in some provinces of United States of America. It bears very hardy fruit, hence can be planted on marginal soils, where rest of the fruits crops cannot be grown. Its cultivation is more popular in peri-urban vicinity. Phalsa fruit is liked for its acidic taste, coloured squash, syrup and medicinal astringent, stomachic values. It decreases inflammation when unripe fruit is eaten and is also administered in respiratory, cardiac and blood disorders, as well as in fever. An infusion of the bark is given as a demulcent, febrifuge and treatment for diarrhea. The root bark is employed in treating rheumatism. The leaves are known to have antibiotic action. It attracts many insects as flower visitors and reported to be pollinated by them Singh *et al.* (2018) [12].
The present studies has been conducted using the various factors such as foraging rate, loose pollen grains sticking to the body, pollination index and fruit set percentage in order to learn about the pollination efficacy of different insects which has not been assessed so far in Phalsa. A better understanding of entomophily may help in better maintenance of Phalsa shrubs and to have better yields.

2. Materials and Methods
The experiments were carried in a well established two years old Phalsa plantation (cv. Dwarf variety) at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) Geographically, it is situated at 26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 meters above mean sea level. The site is located in typical saline-alkaline belt of indo gangetic plains of eastern Uttar Pradesh. The experiment site was having sodic soils. The experiment was conducted in randomized block design. The number of plants selected for observation was ten. The number of treatments were 5 which were replicated 5 number of times.

Journal of Entomology and Zoology Studies 2018; 6(3): 22-24

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(3): 22-24
© 2018 JEZS
Received: 05-03-2018
Accepted: 06-04-2018

Satya Narayan Satapathy
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Umesh Chandra
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Correspondence
Satya Narayan Satapathy
Department of Entomology,
Narendra Deva University of
Agriculture and Technology,
Kumarganj, Faizabad,
Uttar Pradesh, India

Effect of bee pollination, *Apis mellifera* L. on yield and quality parameters of Bael (*Aegle marmelos* Correa)

Satya Narayan Satapathy and Umesh Chandra

Abstract
The present experiment was conducted to mensurate the pollination effect of *Apis mellifera* L. on yield attributing characters i.e. fruits per panicle, its weight and TSS percentage of cultivar "Narendra Bael 9" at Main Experiment Station, Horticulture and Apiculture laboratory, Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad (U.P.), India during 2014. The trees were laden with floral buds/panicles within 7-10 days of emergence of new leaves and reached in full bloom during the months of May-June when days were long and temperature was high. Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators. The treatment applied were pollination by honey bee only, natural pollination with augmentation of honey bees, natural pollination and control (no pollination). Maximum average number of fruit panicle^{-1}, average fruit weight and average TSS percentage were 27.3, 2.05 kg and 41.3% in natural pollination with augmentation of honey bees while minimum 1.3, 1.8 kg and 35.7% were observed in control. Similarly an increase of 2000.00%, 8.46% and 15.68% over control and 47.56%, 6.22% and 5.08% over natural pollination was observed in average number of fruit panicle^{-1}, average fruit weight and average TSS percentage under the treatment natural pollination with augmentation of honey bees.

Keywords: Pollination, *Apis mellifera*, Bael fruit panicle^{-1}, fruit weight, TSS percentage

1. Introduction

Pollination is defined as the transfer of pollens from male portion of a flower to the female portion which is essential for the process of fertilization and production of fruits and/or seeds [1]. About 90% pollination is carried out by insects, 85% of which comprises the honeybees [2]. The nature and extent of pollination can vary between crops, ranging from increasing the quality and quantity of fruits or seeds and increase genetic diversity within crop species [3]. Inadequate pollination can result not only in reduced yield but also in delayed yield and a high percentage of inferior fruits [4]. The insects of family Apidae are the most reliable agents for pollination. Among members of Apidae family, honey bees are particularly important pollinators as they are capable of carrying pollens with which they feed their immature stages, and in the process, the plants visited by them are benefited [5]. Bees are active when flowers are most receptive. Collection of pollens by bees usually ends before noon but nectar collection continuous into late afternoon. Bees visit the fruit producing flowers more often than the male blossoms and stay on them longer [6].

Bael is mostly cross pollinated fruit crop and pollination is carried out by various insect pollinators like honeybees, hover fly, yellow wasp, carpenter bee, weevil, black ants, butterflies etc. [7] Emergence of new leaves commenced during the 2nd and 4th week of May and continued till July. The transfer of pollen requires some agents and animal pollinators such as honeybee, *Apis mellifera* L. play an important role for carried out the pollination process [3]. The present study was planned to determine the effect of pollinators including honeybee (*Apis mellifera* L.) on yield and quality parameter of bael.

2. Materials and Methods

The present study was carried out under saline sodic soil condition and experimental site is located at Main Experimental Station, Department of Horticulture, Narendra Deva University of Agriculture and Technology, Faizabad (U.P.) [26.47^0 N latitude, 82.12^0 E longitude and altitude of 113 metres from mean sea level] during 2014. A randomized block design (RBD) with four treatments and six replications was applied.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 784-786
© 2019 JEZS
Received: 16-09-2019
Accepted: 18-10-2019

Sachin Kumar
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Umesh Chandra
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

SK Yadav
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Jyoti
Department of Seed Science and Technology, N.D. University of Agriculture & Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Vinod Kumar
Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture& Technology, Meerut, Uttar Pradesh, India

Corresponding Author:
Sachin Kumar
Department of Entomology, N.D. University of Agriculture& Technology, Kumarganj, Faizabad, Uttar Pradesh, India

Population dynamics of pigeonpea pod fly (*Melanagromyza obtusa*) and their correlation with abiotic factors in pigeonpea

Sachin Kumar, Umesh Chandra, SK Yadav, Jyoti and Vinod Kumar

Abstract
The present investigations entitled "Population dynamics of pigeonpea pod fly (*Melanagromyza obtusa*) and their correlation with abiotic factors in Pigeonpea" was carried out at Students' Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad during *Rabi*, 2017. The pest activity started with the initiation of pod formation and continued though at varying level, throughout the reproductive stage of the crop. The presence of maggots of *M. obtusa* was noticed for the first time in 5th standard week. The maximum maggot population (37 maggots /100 pods) were recorded during 9th SW and the highest pupal population of (21pupae /100 pods) were recorded in 12th SW. It is evident from data that during 2017-18, maggots population showed non-significant negative correlation with minimum temperature (-0.261) and maximum temperature (-0.243) while relative humidity showed non-significant positive correlation (0.529) and pupal population had non-significant positive correlation with minimum temperature (0.195) and maximum temperature (0.389) while relative humidity showed non-significant negative correlation (-0.196).

Keywords: Population dynamics, pigeonpea pod fly, *Melanagromyza obtusa*, correlation, abiotic factor and pigeonpea

1. Introduction
Pigeonpea [*Cajanus cajan* (L.) Millsp.] is also known as red gram or arhar or tur in vernacular, the most important delicious pulse of the entire country. After gram, pigeonpea is the second most important pulse crop of India, which contributes about 90 per cent of the world's pigeonpea production. Area under pigeonpea in India is about 53.87 lakh hectare with an annual production of 45.99 lakh tons and productivity of 854 kg/ha. Pod fly being an internal feeder, both the maggot and pupal stages are present inside the pods. The white maggots feed on the developing seed and pupate inside the pod. The pod fly infested pods do not show any external symptom of damage until the fully grown larvae chew the pod wall leaving a thin papery membrane intact known as window through which adults exit the pods and thus it becomes hard to manage the pest in time. Pod fly, *Melanagromyza obtusa* (Malloch) is a key pest of pigeonpea (*Cajanus cajan*) throughout South-east Asia. It attacks the crop from pod filling to pod maturity. The oviposition of pod fly takes place on the inner surface of the pod walls. Females deposit the eggs singly under the epidermis in the green pods and the larvae after hatching mines into the pods and feeds on the soft seed thus making it unfit for human consumption as well as seed purposes (Lal and Yadav, 1993) [7]. Pulse are important components of over daily dietary requirements as they are cheapest sources of protein, vitamin, energy and minerals, production of pulse increase at a much slower rate compare to cereal, oil seeds and other crops over the two decades. Just like other crops, include of red gram in cropping pattern repair soil health and soil fertility. It plays an important role in human diet and also improving soil fertility through the biological nitrogen fixation. Arhar is one of the most important pulse crop, to be cultivated in 25 countries of the world on 5.8 million ha with 4.4 million tons of production, whereas in Asia it is grown in 5.07 million ha and producing 3.07 million tons in 2011 (FAO, 2013) [4]. Pigeonpea is a most important *Kharif* pulse crop grown in India. Area under pigeonpea in India is about 53.87 lakh hectare with an annual production of 45.99 lakh tons and productivity of 854 kg/ha (Anonymous, 2017) [1]. Pod fly incidence was started from the second week of January (2.0 to 2.8%) and continues till harvest, with a peak of 15.6 per cent in the first and 13.7 per cent in the second year during the third week of January and the incidence showed significant negative correlation with the

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-II) : 1417-1419 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

SEASONAL INCIDENCE OF WHITEFLY (*BEMISIA TABACI GENNADIUS*) ON OKRA IN JHANSI REGION (UP)

Umesh Chandra[1], Abhishek Kumar Chaudhary[1], Rahul Kumar Singh[2] Prateesha Goswami[3] and Ankita Rai[3]
[1]Department of Entomology, N.D.U.A. & T., Faizabad-224229, India
[2]Department of Extension Education, N.D.U.A. & T., Faizabad 224229, India
[3]Department of Biotechnology, S R Group of Institutions Ambabai Jhansi 284419, India
*E-mail: ucojha@gmail.com, abhichaudhary15@gmail.com

ABSTRACT

A trial was conducted to know the seasonal population dynamics of whitefly, *Bemisia tabaci* in okra (Arka Abhay) and their relation to weather parameters during kharif (2014 and 2015) seasons viz., The population of adults whitefly were and evening vapour pressure (r= 0.52 and r= 0.65), and evaporation (r= 0.53) whereas, negative correlation was expressed with morning RH% during kharif 2014. Similarly during the kharif season (2015) of okra the maximum and minimum temperature (r= 0.0451 and r= 0.040) morning whitefly population while, morning RH% was exhibited negative. Overall results revealed that weather parameters like temperature, RH%, sunshine and rainfall were played limiting factors for the buildup of whitefly population in okra agro-ecosystem.

Okra (*Abelmoschus esculentus* L.) belongs to family Malvaceae or Mallow, which is locally known as Bhendi and Lady's finger worldwide. It is very popular summer vegetable for home gardening while it is also grown commercially throughout the world especially in Indo-Pakistan sub-continent. It is probably originated in Ethiopian region of Africa (Naheed *et al.*, 2013). Okra is a widely cultivated vegetable crop within tropical and subtropical regions, for its immature pods which are consumed either fresh or after processing Duzyaman . The immature pods are consumed as boiled vegetables. It is also dried and used as soup thickeners or in stews (Yadev Dhanker 2009). The green fruits are rich sources of vitamins, calcium, potassium and other minerals. Despite the nutritional value of this important vegetable crop, its optimum yields (2-3 tons/ha) and quality have not been attained in the tropical countries partly because of a continued water shortage and other climatic limitations. Okra plant require relatively average temperatures and unable to tolerate low and high temperature for long time. Okra is a high water crop which has notable drought tolerance.

METHODS AND MATERIALS

Experimental layout : The experiment was conducted at the Student Structional Form Narendra Deva Agriculture University Kumarganj Faizabad UP) during 2015 and 2016. The experiment was laid out in Randomized Complete Block Design (RCBD). Each treatment measured 4 x 4 m^2. There were seven rows in each treatment and each row had 15 plants. Plant to plant and row to row distance was kept 60 cm and 45 cm, respectively. A buffer zone of 60 cm wide was kept between adjacent treatments to isolate them from one another. Uniform cultural practices including ploughing, irrigation, fertilizer and weeding were followed in each treatment.

Population dynamics of whiteflies : The pest population observation was recorded at 7 days interval, after sowing. The population dynamics was determined by correlating weather parameter incidence of okra insect- pests. Five lines of each Incidence plot were sown and observations were recorded on the insect-pests incidence at weekly interval right from after sowing till to the harvesting of the crop on five randomly selected plants for the sucking pests and predators, while borers incidence was recorded on ten randomly selected plants. The observation on sucking pest viz., whitefly was recorded on three leaves per plant, i.e. one upper, one middle and one lower leaf, while for fruit and shoot borer, whole plants were observed for number of infested shoots in the early crop growth stage and in later crop growth stage infested buds/fruits were taken into account. The number of larvae and adults of predators were recorded from these randomly selected five plants, (Patel *et al.* 2012).

Statistical analysis : The data recorded for each parameter was analyzed statistically by using Statistix 8.1 Software and means were separated by using Fisher Protected Least Significance Difference Test at 5% level of significance

RESULTS AND DISCUSSION

The results (Figure-1) showed that, the incidence of white fly population has no infestation in the month of August and September. The incidence of white fly commenced from fourth week after sowing that is, second week of September with an average population level of 0.50 in

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-I) : 975-980 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

POPULATION DYNAMICS OF MAJOR INSECT-PESTS AND THEIR NATURAL ENEMIES ON OKRA (*ABELMOSCHUS ESCULENTUS* L.) CROP IN FAIZABAD (UP)

Abhishek Kumar Chaudhary[1], P.K. Gupta[1], Umesh Chandra[1], Chandan Kumar Singh[2] Rahul Kumar Singh[3], *Dharmendra Singh[2] and Vikas Kumar Singh[2]

[1]Deptt. of Entomology, [2]Deptt. of Pathology, [3]Deptt. of Extension Education, N.D.U.A. & T., Faizabad -224229, India

*E-mail : dmdm8780@gmail.com

ABSTRACT

The present field experiment was conducted during kharif season of year 2013 and 2014 at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India to study the population dynamics of okra insect-pests and their natural enemies. The result revealed that major insect-pests and their natural enemies in Okra started from 2nd and 3rd week of August on 4-5 week-old plant-5 s and continued until fourth week of December on 25-week-old plant-5 s.. Investigations on Population dynamics of major insect-pests and their natural enemies on Okra revealed association of a total 12 arthropods with this crop. Among these seven viz- whitefly (*Bemisia tabaci*), jassid *Amrasca biguttula* (Dist.), Thrips *Thrips tabaci* (Lind.), Fruit borer *Helicoverpa armigera* (Hb.), okra shoot and fruit borer *Earias vittella* (Fabricius), aphid, *Aphis gossypii* (Glov.), and leaf hopper, *Amrasca devastans*. Five viz- lady bird beetle Coccinella septumpuntata and *Cheilomenes undecimpuntata* Linn.,) and predatory spider *Oxypus* spp. Green Lace wing *Chrysoperla Carnea* (Stephens) Mrid bug and Ants were recorded as natural enemies associated with this crop. The appearance of the major insect pests from 31th SW observed to 50 SW during *Kharif* 2013 and *Kharif* 2014 0.57 leaf hopper /plants at 30th SW during *Kharif* 2015 respectively.

Key words : *Whitefly, Jassid, Thrips, Fruit borer, Okra shoot and fruit borer Earias vittella aphid, and leaf hopper.*

The okra, *Abelmoschus esculentus* L. (Malvaceae) is an important vegetable of India and eaten by people with a great interest. The okra crop is infested by a number of insect pests like *Amrasca devastans, Earias vittella, Bemisia tabaci, Helicoverpa armigera, Acrocercops bifasciata, Thrips tabaci, Aphis gossypii, Podagrica, Anomisflava, Sylepta derogata, Haritalodes dervgata, Dysdercus koengii* and *Nezara viridula*. But *Amrasca devastans, E. vittela, H. armigera* and *B. tabaci*, are the notorious and major insect pests of okra (Dubey *et al.*, 1999; Basu, 1995; Lohar, 2001). Insect pest infestation not only reduce the growth but also transmit pathogenic diseases (Sheedi, 1980; Dhaliwal *et al.*, 1981). This challenging situation invites attention of entomologists to concentrate energies on integrated pest management (IPM) of okra and other crops (Huffaker and Carl, 1980; Dhaliwal *et al.*, 1981; Mahadevan and Chelliah, 1986; Dubey *et al.*, 1999; Kumawat *et al.*, 2000) Botanical insecticides (Neem oil or biosal and tobacco extracts), microbial control (Bacillusthuringiensis) and biological control agents (spider, ant, lady bird beetle, Orius, myrid bug, Laius, Chrysoperla, Trichogramma etc.) should be integrated for economic management of insect pests (Arora, *et al.*, 1996; Abro et al., 2004; Memon et al., 2004).

MATERIALS AND METHODS

The experiment was conducted at Student Structional Form, N. D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the plot size 600m² following recommended practices during Kharif 2013 and 2014. Date of sowing- 12th July 2013 and 16th July 2014. The okra (cv. Arka Anamika) was sown in well prepared soil on ridges. The distance between row to row was 60 cm, and plant-5 to plant-5 45cm. The seed rate was 8 kg per acre. Observations were recorded on five randomly selected plant-5 s at weekly intervals starting with 14 days after sowing (DAS) till harvesting in terms of number of arthropods, per plant-5 using rectangular cage 45cm long, 30cm wide and 90cm high, according to the stage of crop at Student Structional Form, between 5-7 A.M. Larval population of shoot & fruit borer and fruit borer was recorded at weekly intervals on 5 randomly selected plant-5 s starting with 50 % flowering till harvest. The data of the treatments were recorded at weekly intervals. While recording the data, it was noted that the observations on insect pests and predators should be recorded early in the morning because of flying and moving of these creatures. The observations were recorded through tagging 5 plant-5 s selected at random in each treatment. The populations of sucking insect complex were recorded as per leaf, from five leaves by selecting one from top, 2 from middle and 2 from bottom portion of plant-5, while the population of chewing insect pests and predators were recorded as per plant-5. The pre-treatment observations were recorded before employing plant-5 protection tactics, while post-treatment observations were recorded 48 hours after application of the respective bio-rational pesticide. Weekly Meteorological data during crop was collected from Agro meteorological observatory N. D. University Agriculture

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 12 (Special-II) : 1598-1603 (2017)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

EFFECT OF BIO-RATIONAL INSECTICIDE AGAINST OKRA SHOOT AND FRUIT BORER UNDER FIELD CONDITION DURING KHARIF SEASON 2015-16

Umesh Chandra[1], Abhishek Kumar Chaudhary[1], Ashish Kumar Gupta[2], Ramesh Singh[2] and Mahesh Kumar[2]

[1]Department of Entomology, N.D.U.A.& T., Faizabad-224229, India
[2]Department of Agriculture , S.R. Group of Institutions Ambabai Jhansi 284419, India.
E-mail : ucojha@gmail.com

ABSTRACTS

Okra (*Abelmoschus esculentus*) is cultivated throughout the year but *summer* and *kharif* are the favorable season for its cultivation. The major insect of shoot and fruit borer (*Earias vittella* Fabricius) is a major pest of okra effect direct loss in marketable fruit. Present investigation is being undertaken to evulateBio-rational insecticide and chemical insecticidematerial in the management of okra shoot and fruit borer (*Earias vittella* Fabricius) in research form of were carried out during the *Kharif* 2015-16seasons at Students' Instructional Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) The biorational insecticide are use to reduce the shoot and fruit damage like neem oil 2%, NSKE 5%, Garlic leaf extract 2%, Spinosad 45 SC120 gai.,Bt + Spinosad0.75kg + 0.6 g a i., *Bacillus thuringiensis*1.5 kg/ha, *Beavaria bassiana*, and Emamactin Benzoate12 g a iper ha. The highest suppression of shoot infestation was Emamactin Benzoate 2.91, NSKE 4.67, neem oil 5.85 Spinosad 5.74,Bt + Spinosad 6.12, *Bacillus thuringiensis* 7.05 *Beavaria bassiana* 6.87,and lowest, followed by Kranj oil 8.25, Zinger Extract9.93, garlic extract 14.20 compared to untreated control 8.14. The highest suppression of fruit infestation was Spinosad 5.16, Emamactin Benzoate 5.32, , Bt + Spinosad 9.26, *Bacillus thuringiensis* 14.15, neem oil 20.20, *Beavaria bassiana* 21.20, NSKE 20.34,and lowest, followed by Kranj oil 28.68, Zinger Extract 34.70, garlic extract 36.74 compared to untreated control 39.16.

Key words : *Earias vittella, Abelmoschus esculentus, biorational insecticide.*

Okra (*Abelmoschus esculentus* (L.) Monech is a importantsummer vegetable crop grown all over India. It is generally knownas Lady's finger. Among various factors responsible for poor yieldof okra in India, infestation of insect-pests is of prime importanceOkra crop is infested by many insect pests but *Amarasca devastance, Earias vitella, Bemisia tabaci, Helicoverpa armigera* are the majorpest of okra. *Earias vittella* (Fab.) is widely distributed and causes 8.4–73.2% infestation on fruit of okra depending on the season (Kumar and Urs, 1998). The avoidable loss in yield and fruit damagedue to this pest has been estimated from 36-90% (Mishra *et al.*, 2002). In controlling pest population by chemical insecticide theremay be a threat to develop pest resistance, secondary outbreak,phytotoxicity, harmful effect on beneficial organisms, residues infruits and health hazards to consumers. Today newer safer moleculeslike insect growth regulators (IGR's), synthetic pyrethroids, chitinsynthesis inhibitors, oxadiazanes etc. and insecticides based onnatural products are commercially available in the market. Theincreasing concern for environmental safety and global demand pesticide residue free food have evolved keen interest andnecessitated a deep insight into the issue of safer products in pestmanagement. Unraveling of this information will enable us in carefulmanipulation of insecticides in the management of *E. vittella*.

MATERIALS AND METHODS

The present investigation was conducted at theStudent Structional Form, N.D. University Of Agriculture and Technology. Kumarganj, Faizabad (U.P.) India- 224229 by growing a popular variety 'Arka Anamika in the plot size 600m^2 following recommended practices during Kharif 2015. Date of sowing- 12th July 2015. For studying seasonal incidence of *E. vittella* plot size of 3 x 5 m2 were prepared at the five different places in the research farm and for studying the Bioefficacy of some indigenous products and spinosad in the management shoot and fruit borer (*Earias vittella* Fabricius) in Faizabad. The randomized block design (RBD) with 3 replications and 10 treatments in plots of 4 x 4 m^2 size were prepared and two seeds were dibbled per hill at 5cm depth with 60 cm row to row spacing and 45 cm plant to plant spacing was maintained. Arka Anamikaokra variety was sown during *kharif* 22th July, 2015 by following practices, After 10 days of sowing, thinning and gap filling was done to maintain one plant per hill. Recommended fertilizers were applied @ NPK 50:25:25 kg/ha and 20 ton FYM per hectares. Full dose of P & K and half dose of N were applied as basal in the drills before sowing the seed and rest of the nitrogen was top dressed in two equal splits at 21 and 41 days after germination. All cultural practices were carried out as per recommendationNeem oil 2%, NSKE 5%, Garlic leaf extract 2%, Spinosad 45 SC 120 g a i., Bt + Spinosad 0.75kg + 0.6 g a i., *Bacillus thuringiensis* 1.5 kg/ha.

Global Veterinaria 22 (5): 267-272 2020
ISSN 1992-6197
© IDOSI Publications, 2020
DOI: 10.5829/idosi.gv.2020.267.272

The Saga of Macrominerals and its Role in Reproduction in Domestic Animals: A Review

[1]Rajesh Kumar, [2]R.P. Diwakar, [3]H.C. Verma, [4]Anand Kumar, [5]Pramod Kumar, [6]K.D. Singh and [2]Vibha Yadav

[1]Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India
[2]Department of Veterinary Microbiology, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[3]Department of Veterinary & Animal Husbandry Extension Education, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[4]Department of Veterinary Gynaecology & Obstetrics, Ranchi Veterinary College, B.A.U., Kanke, Ranchi-06, Jharkhand, India
[5]Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[6]Department of ILFC, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India

Abstract: A number of inorganic elements are essential for the growth, production and reproduction of animals. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Key words: Domestic Animals · Macrominerals · Production · Reproduction

INTRODUCTION

A number of inorganic elements are essential for the growth, production and reproduction of animals [1]. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. The inorganic elements are classified according to their requirements in animal body. Those required in greater quantities are referred as macrominerals (calcium, phosphorus, sodium, chloride, potassium, magnesium and sulfur). Macrominerals required in large amount each day and their concentration in diet is expressed as percentage of diet or in grams per kilogram of diet. Macrominerals has role in different physiological functions. Other elements required in much smaller amounts are referred as trace minerals (microminerals) i.e. copper, cobalt, iodine, iron, manganese, molybdenum, selenium, zinc, chromium and fluorine. Their concentration in diet is expressed as parts per million (ppm), which is equivalent to milligram per kilogram of diet or in some cases as parts per billion (ppb), which is equivalent to microgram per kilogram of diet. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Role of Various Macro Minerals in Animal Reproduction

Calcium (Ca): Calcium is an essential component of skeleton and plays a pivotal role in maintaining homeostasis of vertebrates [2]. The maximum portion of calcium present in the bone as hydroxyapatite (99%) and small fractions present in the cell membrane or endoplasmic reticulum (0.9%), extracellular fluid or serum (0.1%) and in cytosol (0.00002%) [3]. Extracellular calcium exist in three forms i.e. ionized (50%), complexes to anions (5%) such as citrate, bicarbonate, phosphate, or lactate and protein bound (45%). Ionized calcium involved in array of physiological processes such as muscular

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India.

EFFECT OF A-TOCOPHEROL ACETATE AND ZINC SUPPLEMENTATION ON LEPTIN HORMONE DURING DRY PERIOD AND EARLY LACTATION IN CROSS BRED COWS

Pankaj Kumar Maurya*, Anjali Aggarwal[1], Pramod Kumar and P.K. Choudhary
College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP)
[1]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001 (Haryana)

Abstract

The study was conducted to investigate the effect of α-tocopherol acetate and zinc supplementation on Leptin Hormone during dry period and early lactation in cross bred cows. Twenty pregnant Karan Fries cows were selected on the basis of their body weight, BCS and parity: ten cows were kept in control group and other ten cows in treatment group which were supplemented with 1000 IU α-tocopherol acetate and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Leptin hormone. Body condition score of all the experimental animals was recorded on the day of blood collection. At parturition, BCS decreased significantly ($P<0.01$) in control group than treatment group. The plasma concentration of leptin was decreased at parturition and the level was significantly ($P<0.001$) higher in treatment group as compared to control group (3.66 vs. 2.55 ng/ml). Plasma NEFA was significantly ($P<0.001$) lower in treatment group as compared to control group. The results of this study indicated that supplementation of α-tocopherol acetate and zinc have beneficial effects in changing Leptin hormone level in this way that improves body condition and metabolic status of the animals.

Keywords: *Leptin, Body Condition Score, Energy Metabolites, α-tocopherol acetate, Zinc*

Introduction

Leptin is a 16 kDa protein hormone and it is synthesized by white adipose tissue. Leptin is involved in regulation of feed intake, energy balance, immunity and reproduction (Houseknecht *et al.*, 2000; Ahima and Flier, 2003). After parturition, dairy cows suffer from an intense energy deficit caused by the onset of copious milk secretion and an inadequate increase in voluntary food intake which contributes to a decline in plasma leptin. This decline mirrors that of plasma insulin but is reciprocal to the profile of plasma growth hormone (GH), suggesting that both hormones may regulate plasma leptin in periparturient dairy cows (Block *et al.*, 2001). Energy deficit of early lactation reduces leptin synthesis in white adipose tissue (WAT), and suggest roles for insulin, GH and metabolic fuels in mediating this effect of energy balance (Block *et al.*, 2001). A concomitant suppression of immune functions and metabolic disorders during early lactation are related to decreased fertility (Butler and Smith, 1989). This may partly be due to decrease in blood concentrations of vitamins A & E and Zn (Meglia *et al.*, 2001, Chandra, 2009). To meet the nutritional demands of milk synthesis during early lactation, dairy cows need to mobilize body reserves causing negative energy balance until nutrient intake covers the demands.

Material and methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). For the present study 20 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 10 cows kept in Control group and other 10 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of α-tocopherol acetate and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum over and above the normal feeding schedule at dairy farm of NDRI.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 3000 rpm at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Leptin hormone. Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Sample analysis

Blood sample was analyzed for plasma leptin and NEFA. Plasma Leptin was determined by "Bovine Leptin ELISA Quantitation kit" from Cusabio Biotech Co., Ltd. The copper soap solvent extraction method modified by Shipe et al. (1980) was adopted for the estimation of plasma NEFA.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software. The correlations among the various parameters were also calculated (Snedecor and Cochran, 1994).

Results and Discussion

Leptin

The mean±SE of plasma leptin concentration of control cows was 6.06±0.10 ng/ml 60 days before calving and on the day of calving it decreased to 2.55±0.31ng/ml. Further, in treatment group the plasma leptin concentration was 6.19±0.11ng/ml 60 days before calving and on the day of calving it decreased to 3.66±0.11ng/ml. In present study decrease in the plasma leptin concentration of control and treatment group cows was 57.92% and 40.87% respectively from 60 days before calving to the day of calving. This decrease was more significant ($P<0.01$) from 30 days before calving to the day of calving in control group than treatment group. After parturition it's level remained low up to 30 days then started increasing up to 60 days of lactation.

In present study there was found a positive correlation between leptin with BCS and insulin and a negative correlation was found between leptin with NEFA in control and treatment group of cows around parturition. The plasma concentration of leptin was positively correlated with plasma concentrations of insulin and negatively correlated with plasma concentrations of growth hormone, cortisol and non-esterified fatty acids (Block *et al.*, 2001; Chelikani *et al.*, 2008). Sauerwein *et al.* (2004) investigated that in ruminants the decline in plasma leptin levels towards parturition is probably caused by the decline in adiposity and insulin concentrations. In ruminants and other animals, leptin is synthesized in proportion to the overall degree of adiposity and acts on the central nervous system to reduce voluntary feed intake (Ehrhardt *et al.*, 2000). Leptin, mainly produced in adipose tissue, inhibits feed intake and down-regulates adipose tissue deposition. Block *et al.* (2001) showed that leptin is negatively correlated with the amount of nonesterified fatty acids, which reflects the amount of fat mobilization. From early to mid pregnancy circulating leptin levels increased and remained elevated until late pregnancy in cattle (Liefers *et al.*, 2003; Villalobos *et al.*, 2007).

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 273-280

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 273-280
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Exogenous Melatonin and Different photoperiods on Serum Glucose and Total Serum Protein levels in Chhotanagpuri Ewe.

P. K. Choudhary[1*], A. K. Ishwar[2], Bablee Jyoti[3], R. Kumar[4], D. Niyogi[5], M. Kumar[6], P. Kumar[1] and P. K. Maurya[1]

[1]Department of Veterinary Physiology and Biochemistry, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi, India
[3]Department of Chemistry, L.N.M.U., Darbhanga, India
[4]Department of Agronomy (A.H.), B.A.U., Sabour, Bhagalpur, India
[5]Department of Veterinary Pathology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[6]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
**Corresponding author*

Keywords

Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Serum glucose, Total serum protein

ABSTRACT

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. After administration of melatonin, serum glucose was decreased in group- III, IV, VI and VII in comparison to group-I, although this decrease was not statistically significant. An increasing trend of serum glucose was observed in all groups from third to fourth month. Total protein at first month was significantly ($P<0.05$) higher in group VI in comparison to 0 day. After administration of melatonin, total serum protein concentration was significantly ($P<0.05$) decreased in group VI in comparison to first month and continued up to third month. At fifth month, total serum protein was significantly ($P<0.05$) lower in group III, IV and VI in comparison to 0 day and first month.

Introduction

Sheep husbandry is backbone of rural economy in India. The Chhotanagpuri sheep is the only recognized breed of sheep found in Jharkhand with a few numbers in Bihar and West Bengal. This breed is maintained solely for mutton production. They produce coarse wool of poor quality. This is being utilized for carpet manufacturing. Sheep

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON LYMPHOCYTE PERCENT COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], Pramod Kumar[1]
D. Niyogi[3] and M. Kumar[4]

[1]Department of Veterinary Physiology and Biochemistry, [3]Department of Veterinary Pathology, [4]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., [2]Department of Veterinary Physiology, B.V.C., B.A.U., Ranchi

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. Lymphocyte % in third and fourth month of experiment was significantly ($P<0.05$) lower in all groups (group-I to VII) in comparison to 0 day, first and second month. At fifth month, lymphocyte % was significantly ($P<0.05$) higher in group III, IV, VI and VII in composition to third and fourth month of experiment.

Keywords: Ewe, Photoperiod, Melatonin, Lymphocyte percent count

Introduction

Short days enhance immune function in individuals with robust reproductive responses to photoperiod. Total splenic lymphocyte number, and macrophage counts were significantly higher in hamsters exposed to short days, as compared to animals exposed to long photoperiods (Brainard *et al.*, 1988). Photoperiodic influences on lymphocyte number and total white blood cell count have been reported for deer mice (Blom *et al.*, 1994); short day (LD 8:16) mice possessed more white blood cells than animals maintained in long day lengths (LD 16:8). Importantly, all laboratory studies of photoperiodic effects on immune function have reported enhanced immune function in short day lengths (Nelson and Demas, 1996). Although many field studies support this hypothesis, with data suggesting enhanced immune function and decreased disease prevalence during the winter as compared to the summer, a substantial number of studies have reported the opposite pattern of results (Nelson and Demas, 1996); i.e., reduced immune function is coincident with the short days of winter. These conflicting results can be resolved by considering additional environmental factors, not usually manipulated in laboratory studies. For example, winter-associated stressors (e.g., restricted food and low ambient temperatures) appear to counteract short day enhancement of immune function in the lab.

Exogenous administration of melatonin increased the lymphocyte percentage in Broiler chicks (Abozahra *et al.*, 1998), Rats (Anwar *et al.*, 1998), and Squirrels (Rai *et al.*, 2009). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17:30 to 18:00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in lymphocyte percentage is not clear. However, several mechanisms may be involved in this respect. Haldar *et al.* (2006) accessed the effect of melatonin on immune parameters in a seasonally breeding animal, the Indian palm squirrel F. pennant and bird P. asiatica during reproductive phases in vivo as well as in vitro. Melatonin treated squirrels and birds showed an increase in percent lymphocyte count (% LC) and percent stimulation pinealectomy in squirrels. Melatonin administration recovered all the decreased immune parameters to the control level (Rai and Haldar, 2003). MEL supplementation also enhanced all immune parameters in both in vivo and in vitro, suggesting that the immune system was sensitive during the reproductively active phase to MEL when peripheral melatonin level was low and the role of melatonin could be important for the maintenance of the immune status of seasonal breeders.

As reported by Etim *et al.* (2014[a]) immune status is a function of leucocytes, lymphocytes and Neutrophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine Lymphocyte percent count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36°N latitude and 85.33°E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]:- The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]:- In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]:- Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1021-1022

Mukesh Kumar
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Gaurav Panday
PhD Scholar Dept. of Livestock Production Management, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

KN Singh
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

SS Sanger
Assistant Professor Dept. of Livestock Product Technology, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

PK Chaudhary
Assistant Professor Dept of Vet. Physiology & Biochemistry, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Pramod Kumar
Assistant Professor Dept of Vet. Physiology & Biochemistry, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Correspondence
Mukesh Kumar
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Comparative studies on urinary system of Aseel and Rhode Island Red (RIR) breeds of poultry

Mukesh Kumar, Gaurav Panday, KN Singh, SS Sanger, PK Chaudhary and Pramod Kumar

Abstract
The present comparative study was conducted to evaluate the urinary system of Aseel and Rhode Island Red (RIR) breeds of poultry and experiments was done on 24 apparently healthy birds of Aseel and RIR breeds of poultry which were divided into grower and adult groups. Each kidney was divided into cranial, middle and caudal divisions by the grooves present on the ventral surface. In RIR grower as well as in adults, weight, volume and maximum width of kidney to body weight was more in RIR grower than Aseel. While, in adult birds it was more in Aseel than RIR. The ureter had two parts, renal and pelvic. Highly significant difference was observed in the weight, length and volume of both the ureters of an RIR grower than Aseel.

Keywords: Aseel, RIR, Gross morphology, Urinary system

Introduction
Avian urinary system has consisted of the kidney and ureter only. Kidneys play an important role in maintaining homeostasis. The ureter is an important organ, which carries urine to the cloaca. There was no literature available on the gross studies of the urinary system of this breed. The present work was undertaken to study the comparative gross morphology of the urinary system of Aseel and RIR breeds of poultry.

Materials and Methods
The experiment was done on 24 apparently healthy birds of 2 groups of RIR and Aseel breeds of poultry irrespective of sex. The birds were divided into grower and adult (group I and II) respectively. Both the groups had 12 birds, 6 birds of each breed. After taking the body weight, birds of the specified age group were sacrificed by cutting jugular vein and common carotid artery. Kidney and ureter were collected and their length and width were recorded by using Vernier caliper, weight was taken with the help of electronic monopan balance whereas, volume was taken with the help of the water displacement method. The data were statistically analyzed by using analysis of independent mean "T" test as per Snedecor and Cocharan (1994) [2].

Results and Discussion
Kidney: The colour of the kidneys was reddish brown. The right and left kidneys were retroperitoneal and present symmetrically in a depression on ventral surface of synsacrum and renal fossa of ilium. Depression on the synsacrum was extended upto the distal third. The cranial margin of each kidney was extended immediately caudal to the lungs between the sixth and seventh thoracic vertebrae. These extended upto the rostral third of gizzard in grower birds while, in adult birds upto the distal third of gizzard. On the surface of the kidney small projections were seen in all three divisions. This might be the external surface of the renal lobule.

The dorsal surface of the kidney had the impression of lumbosacral mass, which extended from the medial border to the middle of the kidney. The impressions were shallow in grower birds that an adult bird in both breeds. Each kidney was divided into cranial, middle and caudal divisions by the grooves present on the ventral surface. The groove was shallow and directed caudo-laterally from median plane. However, (Nubipour *et al.* 2009) [1] started that the groove was transverse. External iliac artery was present in the groove between the cranial and middle division. Groove containing ischiatic artery seprated the middle and caudal division of the kidney.

In both breeds and age groups, the shape of the kidney was similar. The cranial division was oval elongated, middle division was slender and caudal division was irregular.

COMPARATIVE EFFECTS OF CEFTIOFUR SODIUM, GENTAMICIN SULFATE AND *Zingiber officinale* ON HEMATOLOGICAL PARAMETERS OF ENDOMETRITIC BUFFALOES (*Bubalus bubalis*)

Pushkar Sharma[1], Sushant Shrivastava[2], Vijay Gautam[1], Rajesh Kumar[2*], Pramod Kumar[3] and Saurabh[1]
1 M.V.Sc. Scholar, Department of Veterinary Gynaecology and Obstetrics.
2 Department of Veterinary Gynaecology and Obstetrics.
3 Department of veterinary physiology and biochemistry
College of Veterinary Science & Animal Husbandry, Narendra Dev University of Agriculture & Technology, Faizabad-224229 (U.P) India.

Abstract
The present study aimed to investigate the comparative therapeutic efficacy of Ceftiofur sodium, Gentamicin sulfate and Zingiber officinale extract on hematological parameters of endometritic buffaloes. The endometritic affected animals were randomly allotted to five groups namely Groups CB, C, G, CF and GG comprising of ten animals in each group. Haemoglobin, PCV, TLC, DLC and ESR values were analysed at 0, 15th day and 30th day in each group. Haematological profile was differed significantly between cyclic and endometritic buffaloes. The findings indicated blood indices helps in diagnosis of clinical endometritis in buffaloes.
Keywords– *Endometritis, Ceftiofur sodium, Gentamicin sulphate, Zingiber officinale.*

Introduction

Endometritis is inflammation of the endometrial lining of the uterus and formation of mucopurulent secretion. It is a major cause of repeat breeder syndrome of bovines. Unlike metritis, it does not affect the general health. Therefore it has a major economic impact by poor conception rate, increasing calving interval, reduction in calf crop, increased cost of treatment decrease milk yield and increase cull rate. The most common initiating cause of endometritis is non-specific, opportunist pathogens that contaminate the uterus during the pericalving period, dystocia, retained foetal membranes (RFM), caesarian section, contamination of uterus at the time of A.I., induced parturition, still birth, twins, ovarian inactivity, cystic ovaries, unhygienic calving environment, concurrent disease and nutrition - fatty liver disease and hypocalcaemia are reported to increase endometritis rates, natural insemination infected with venereal disease, etc (Noakes *et al.*, 2002). Opportunistic pathogens are not able to colonize in the genital tract during normal circumstances due to several protective mechanisms, viz., anatomical and functional barriers, specific and nonspecific immune responses (Foldi *et al.*, 2006). Blood is a crucial importance for maintain of physiological equilibrium in the body. Normal levels of vital haematological constituents are of most importance for maintaining functional integrity of the reproductive system. Any change in haematological parameters may adversely affect the reproductive efficiency of livestock. Haematological indices are useful in diagnosing various pathological and metabolic disorders, which can adversely affect the production and reproductive performance of buffaloes.

Materials and methods

In these study mainly two commonly used antibiotics ceftiofur sodium and gentamicin sulphate and one herb extract, *Zingiber officinale* were selected for treatment of endometritic buffaloes. The cases of Instructional Dairy Farm Complex, Teaching Veterinary Clinical Complex, Veterinary hospitals lying adjacent to Kumarganj, Faizabad, and cattle colonies near Buddeyshwaran, lucknow (U.P) India were selected for study purpose. *Zingiber officinale* extract was prepared in Soxhlet apparatus as per standard method and then concentrated in vacuum rotary evaporator at 40^0 C for ethanol removal. One gram concentrated extract was mixed in double distilled water in floor shaker water bath used for intrauterine therapy.

The buffaloes were categorized into five groups for the present study, viz., Normal cycling healthy estrus buffaloes (**CB**), No treatment is given, recommended for sexual rest (**C**), 10ml (40mg/ml) Gentamicin sulfate (dissolved in 40 ml of distilled water) intrauterine daily for three days(**G**), 500mg Ceftiour Sodium (dissolved in 50 ml of distilled water) intrauterine daily for three days.(**CF**), One gram Extract of *Zingiber officinale* (dissolved in 50 ml of distilled water) intrauterine daily for three days (**GG**). Blood Sample was collected three times (0, 15th and 30th day) during the whole experimental period. Approximately 5 ml of blood was collected aseptically from the jugular vein of each experimental animal in sterilized disposable syringe (16 gauge needle). All haematological values obtained were subjected suitable statistical methods (Snedecor and Cochral, 1989).

Results and Discussion

In the present research work, blood indices such as Hb, PCV, TEC, TLC and DLC were estimated to investigate any possible correlation in between endometritis and hematological profile of buffaloes.

Hemoglobin (Hb)

The overall mean hemoglobin in pretreated, 15th, 30th day post treated and in regular cyclic buffaloes were given in the table 3.1. and column chart 3.1. Hemoglobin levels were increased significantly ($P<0.05$) in gentamicin (G) and ceftiofur (CF) after 30th day post treatment. Pateria and Rawal (1990) and Pateria *et al.*, (1992) also observed significant increase ($p<0.05$) in haemoglobin level after treatment in buffaloes which were affected with metritis and endometritis. The decrease in haemoglobin level of affected buffaloes is probably due to disintegration of erythrocytes and/ or effect of some haemolytic type of microbes and their endotoxins on the blood cells and haemopoietic system. Similar results were obtained by Dhoble and Gupta (1981), Jaini *et al.*, (1995), Ahmad *et al.*, (2003), Rathour *et al.*, (2005) and Narnaware and Sirothia (2010) in buffaloes. The mean Hb levels in responded animals was lower at the time of treatment and increased significantly ($p<0.01$) after 21 days in next estrus. Pradhan *et al.*, (1995) reported that lower level of Hb values which may be representing some systemic derangement due to deficiency of certain trace minerals which in turn depressed the physiology of reproduction. The low level of Hb indicated long term protein deficiency and influences tissue oxygenation of reproductive tract which in turn affects the cyclicity (Ramakrishna, 1997). Lack of sufficient quantities of Hb in blood is responsible for reduced oxygen transport to the vital tissues, it causes reduced oxidation of nutrients, which in turn affect the whole cellular metabolism in gonadal cells which is metabolically more active. (Sabasthin *et al.*, (2012) reported that decrease in the Hb value in the animal could be the cause of repeat breeding. The trend of variation in PCV was found to be similar to be the value of Hb and ESR in both cattle & buffaloes. Similar finding was also reported by Anthony *et al.*, (2012) and Verma (2015).

Packed Cell Volume (PCV)

The mean value of PCV in regular cyclic buffaloes group (CB) was observed as 30.89±0.31% PCV values were reported as 29.22±0.27, 28.69±0.28 & 9.21±0.22 per cent in untreated control, 29.05±0.36, 29.75±0.52 & 29.75±0.52 per cent in gentamicin, 28.18±0.29, 30.54±0.46 & 31.07±0.40 per cent in ceftiofur (CF) groups and 29.03±0.42, 29.63±0.45 & 30.19±0.25 percentage in *Zingiber officinale* extract at 0, 15th and 30th day post treatment, respectively (Table No. 3.1 and column chart 3.2). Significant ($p<0.01$) increase in PCV was observed in all the treatments at 30th day post treatment. This indicates that the mean PCV increases after treatment by using any biological modifier which reduces the infection. The present

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF VITAMIN E AND ZINC ON CORTISOL HORMONE DURING PERIPARTUM PERIOD IN CROSS BRED COWS

Pankaj Kumar Maurya[1]*, Anjali Aggarwal[2], P. K. Choudhary[1], Pramod Kumar[1], Gulab Chandra[3], A. K. Singh[4] and Ovais Aarif[5]

[1]C.V.Sc. & A.H., N. D. University of Agri. & Tech., Kumarganj, Ayodhya (UP) India,
[2]Dairy Cattle Physiology Division, NDRI, Karnal (Haryana),
[3]COVAS, SVPUAT, Meerut (U.P.), [4]C.V.Sc. & A.H., Rewa (M.P.), [5]FVSc & AH, SKUAST K

Abstract

The study was conducted to investigate effect of vitamin E and zinc on cortisol hormone during peripartum period in Karan Fries cows. Sixteen pregnant Karan Fries (KF) cows were selected from the herd of National Dairy Research Institute (NDRI) Karnal, on the basis of their body weight, BCS and parity. Eight cows were kept in control group and other eight cows in treatment group which were supplemented with 1000 IU vitamin E and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Cortisol hormone. Body weight and Body condition score (BCS) of all the experimental animals were recorded on the day of blood collection. Plasma cortisol was significantly (P<0.001) lower in treatment group as compared to control group (2.98 vs. 3.10 ng/ml). There was a steady increase in the body weight of control and treatment cows towards parturition and was found a significant (P<0.001) difference between the control and treatment groups. The body condition score of control and treatment groups decreased by 33.05% and 17.76% respectively after calving. This showed that the control group cows lost significantly (P<0.001) more body condition as compared to treatment group cows. The results of this study indicated that supplementation of vitamin E and zinc have beneficial effects in changing cortisol level in this way that improves body condition and decreases the effect of parturition stress in the animals.

Keywords: Cortisol, Body Condition Score, Energy Metabolites, Peripartum period, Vitamin E, Zinc

Introduction

Cortisol is a steroid hormone that helps the body respond to stress. It is also called the stress hormone. It is released in response to stress and low blood glucose concentration. It is the principal glucocorticoid during the reproduction and lactation of cows [1]. Adrenal secretion of cortisol is modulated by a complex negative feedback mechanism involving the central nervous system, hypothalamus, pituitary and adrenals [2]. The synergistic action of endogenous cortisol along with other hormones has been found to be critical for parturition and initiation of lactation in domestic animals [3]. At term the corticosteroid concentration rises in the plasma of peripartum cows [4, 5,6]. Plasma total cortisol level increased from 2.13 ng/ml to 2.62 ng/ml till one day prepartum and increased to 6.08 ng/ml at parturition in crossbred cows. The level decline from 3.42 ng/ml on 1 day postpartum to 2.49 ng/ml at 3 day postpartum [6]. In Murrah buffaloes level of cortisol was found 1.46 ng/ml at 30 day prepartum which increased to 3.78 ng/ml at parturition and decline to 1.89 ng/ml at 3 day postpartum[2].

Cortisol concentrations have been used as a physiological marker of stress. During heat acclimation there is reduction of plasma cortisol that helps in reduction of heat production of animals[7]. An initial increase in cortisol occurs due to acute heat stress followed by a decline after prolonged exposure in cows. The animals adjust physiologically to elevated heat loads by decreasing adrenal corticoid output [7]. Cortisol concentrations have been found lower in high producing cows at day 30 than at day 90 or in nonlactating cows due to reduced pulse amplitude. Low cortisol concentrations likely participate in the enhanced production observed in high producing cows [8]. Heat exposure at temperature above 40°C has been found to raise the cortisol level to almost double the pre-exposure levels [9]. Similar results were also found by others in hot-dry, hot-humid and winter seasons in crossbred cows (4.17, 4.35 and 2.09 ng/ml respectively) [10].

Materials and Methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). Karnal is situated on an altitude of 250 meter above mean sea level, latitude and longitude position being 29°42" N and 79°54" E respectively. The maximum ambient temperature in summer goes up to 45°C and minimum temperature in winter comes down to 0°C with a diurnal variation in the order of 15-20°C. For the present study 16 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 8 cows kept in Control group and other 8 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of vitamin E and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum. Animals were maintained in open area with asbestos roof in the sides of the open area, where the animals were offered feed. The open area had brick floor. The animals were free to move inside the controlled open area. All the animals were fed as per the standard feeding practices followed at the NDRI farm.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 1,200×g at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Cortisol.

Sample analysis

Blood sample was analyzed for cortisol. Plasma Cortisol was determined by "Cortisol EIA kit" from Cayman Chemical Company, Ann Arbour, USA. Body weight and Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two-way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software.

Results and Discussion

Cortisol

The mean±SE of plasma cortisol concentration of control cows was 2.87±0.09 ng/ml 60 days before calving and on the day of calving it increased to 3.24±0.07 ng/ml. Further, in treatment group the plasma cortisol concentration was 2.78±0.03 ng/ml 60 days before calving and on the day of calving it increased to 3.10±0.03 ng/ml. In present study, the overall mean±SEM of plasma cortisol concentration was found significantly (P<0.001, Table 2) lower in treatment group as compared to control group. Plasma levels of cortisol varied between 2.3-3.5 ng/ml during pre and postpartum in Holstein cows [11]. After 7 days of calving it's level started decreasing up to 60 day of lactation.

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1076-1079

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1076-1079

Pramod Kumar
Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rishikant
Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rabindra Kumar
Department Of Veterinary Obst. & Gynae. C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

KN Singh
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Mukesh Kumar
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Correspondence
Pramod Kumar
Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

A review: heat stress in cow and buffaloes in India

Pramod Kumar, Rishikant, Rabindra Kumar, KN Singh and Mukesh Kumar

Abstract
India is a tropical climatic country in which heat stress is an important disadvantageous factor that reduces the production performance of cattle and buffalo and conduces to significant decrease in milk yields in dairy cows and buffalo and some metabolically disorders. The objective of this review is to known the heat stress metabolism, its causing factors and its preventative methods for increase the production performance through manage mental and nutritional procedures.

Keywords: Tropical, Heat, Temperature, Conduction, Convection, Radiation, Evaporation, Panting, Sweating, Moisture

Introduction
Climatic conditions of India are such that the hot and humid season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature especially for animal, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance of animal. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003) [20]. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Heat stress is caused by a combination of climatic factors like air temperature, humidity, solar radiation, wind velocity etc. A common time for experience adverse effects of high temperatures is during transport (Fiore *et al*, 2009) [6]. Transport is a multi affected stressor that can create or exacerbate existing heat loads. Handling of animal, increases body temperature. Animal are adversely affected any time the ambient temperature is more than their thermoneutral zone, which ranges about 25°C. Because that heat stress conduces to some disadvantageous affect on livestock, many researchers work about heat stress in animal.

Thermoneutral zone
The Thermoneutral Zone (TNZ) is defined as. "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non evaporative physical processes alone" (Bligh & Johnson, 1973) [3]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal (Silanikove, 2000) [14]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation or acclimatization, level of productivity, housing conditions, insulation, and behavior etc (Yousef, 1985b) [22]. In order to more clearly define the TNZ (Silanikove, 2000) [14] suggested that the subdivision of the TNZ into a zone of thermal well-being is most suitable to describe the relation between an animal and its environment. Figure 1, illustrate this concept.

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 997-998

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

Micrometry of renal corpuscles and renal tubules in *Marwari* Sheep (*Ovis aries*)

Krishna Nand Singh, Sanjeev Joshi, Rakesh Mathur, Mukesh Kumar and Pramod Kumar

Abstract

The microscopic studies of Renal tubules of 6 *Marwari* sheep showed that there was no significant difference between juxtamedullary renal corpuscles and cortical corpuscles. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns. The average diameter of PCT, DCT, collecting duct, thick and thin segment of loop of Henle was 49.91±2.02, 39.14±1.82, 42.80±0.99, 32.85±1.11, and 19.50±0.76 micron respectively.

Keywords: *Marwari* sheep, Micrometry, Renal corpuscles, loop of Henle

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. In mammals the kidneys are compound tubular glands and the chief excretory organs of the body. They have a major role in the maintenance of fluid and electrolyte balance and in control of the blood pressure.

Materials and Methods

The diameter of various parts of uriniferous tubule was measured from random samples seen under light microscope in high power (400X). The Micrometry of Renal tubules across various areas were recorded by using occular micrometer after calculating calibration with stage micrometer to record the observations on mean diameters of various parts of nephron and collecting duct.

Results and discussion

The Renal Corpuscles

Renal corpuscles in the cortical region (Fig.1) had an average transverse diameter of 134.79±5.47 microns and average vertical diameter was 98.99±3.83 microns. The average transverse diameter of juxtamedullary renal corpuscles was 158.63±2.94 microns and average vertical diameter 109.42±3.44 microns. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns (Table 1).

The Proximal Convoluted Tubule

The diameter of the proximal convoluted tubule varied from 39.4 to 67.9 microns, with an average of 49.91±2.02 microns (Table 2). It was similar to the findings of Trautmann and Fiebiger (1957) [4] who stated that the diameter of proximal convoluted tubule ranged from 45 to 60 microns in domestic animals. Yadava and Calhoun (1958) [5] recorded an average diameter of proximal convoluted tubule to be 56, 50, 45 and 45 microns for horse, ox, sheep, and goat respectively. Whereas Ommer and Mariappa (1970) [3] reported in Indian buffalo that an average diameter was 47.4 microns with a range of 40.7 to 64.7 microns and Beniwal (1995) [1] reported in camel that an average diameter was 76.63 microns with a range of 43.98 to 117.28 micron.

INTEGRATION BETWEEN THE THERMAL STRESS INDEX (TGWB) AND THE LIVESTOCK STRAIN INDEX (LSI) AS A GUIDELINE FOR DAIRY FARMING IN TROPICAL CLIMATE

Pramod Kumar[1]*, R.C.Upadhyay[2], P.K.Chaudhary[1], P. K. Maurya[1], Rishikant[3], Rabindra Kumar[4], Rajesh Kumar[4] and R. P. Diwaker[5] and Vibha Yadav[5]

[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[2]Rt.HOD & Principal Scientist, Animal Physiology Division, ICAR-NDRI, Karnal-132001 (Hariyana)
[3] Department of Vety. Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP

Abstract

A new thermal stress index (TGWB Index), based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature suggests as a potential substitute for the temperature humidity index (THI) for cattle in tropical climate. This new stress index, found to have a high correlation to THI, is constructed from fast reading meteorological response sensors (Tdb, Twb, and Tg) that take only a few seconds to reach equilibrium. Furthermore, the TGWB Index is the first stress index using direct measurements of solar radiation and is calculated as follows:
TGWB Index = 0.78 (Tg + Twb) + 35.8
The recently suggested Livestock Strain Index (LSI) is capable of indicating physiological strain and analyzing milk production of cattle. The LSI is constructed from rectal temperature (Tre) and respiratory frequency rate (Rf) as follows:
$LSI = 5\ (Tre_{obs.} - Tre_{min.}).\ (Tre_{max.} - Tre_{min})^{-1} + 5\ (Rf_{obs.} - Rf_{min.}).\ (Rf_{max.} - Rf_{min.})^{-1}$
Where Tre_{obs} and Rf_{obs} are the observed measurements Tre_{max} and Tre_{min}, and Rf_{max} and Rf_{min} are maximum and minimum simultaneous measurements taken at any time. The LSI is scaled from 0-10, whereby each variable LSI_{Tre} or LSI_{Rf} which represent the cardiovascular and the thermoregulation systems respectively. The purpose of this study was to develop guidelines based on TGWB Index and LSI for dairy cattle for combat to heat stress. In order to integrate LSI and TGWB Index, we decided to use both the LSI_{Rf} and LSI_{Tre} component, which represents the respiratory frequency rate and the strain reflected by the cardiovascular system. Furthermore, LSI_{Rf} and LSI_{Tre} are easier to measure, are easier to implement and simplifies the integration with TGWB Index. Concomitantly, it also categorizes the strain between 0-5, the higher the value, the higher the strain.

Key words: Tropical climate, Thermal stress, Indices, Solar Radiation, LSI, TGWB Index

Introduction

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$
(Thom, 1959),

$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$
(National Research Council, 1971),

$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$
(National Research Council, 1971),

$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$
(National Research Council, 1971),

$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$
(Yousef, 1985a),

The above indices have been used to calculate stress for each combination of environmental variables corresponding to the measurements made in the animals, in order to assure that each animal response was associated to a given environmental condition. The index THI1 is used to monitor discomfort of temperature and humidity in humans. The THI2 and THI7 have been empirically determined for cattle exposed to heat stress conditions in climatic chambers. How these indices from controlled environments relate to field conditions? With diurnal fluctuation of environmental variables remain unanswered (Bohmanova *et al.*, 2007). The index THI3 is used to monitor the degree of discomfort in humans. The THI5 represents cattle heat stress index, designed to indicate level of heat stress of outdoors cattle (West, 2003); and THI6 has been developed by the United State Weather Bureau to describe discomfort in humans.

THI values of 70 or less are considered comfortable, 75 to 78 stressful, and values greater than 78 because extreme distress and animals are unable to maintain normal body temperature (Silanikove, 2000). The THI fails to reflect the contributions of other environmental factors, such as airflow and thermal radiation.

As noted before, the index has gained immense popularity over the years. The temperature humidity index (THI) is in use in temperate climatic condition for cattle. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). It is important to note the correlation of temperature humidity index (THI) to physiological responses was only partially tested and was based mainly on the correlation between the number of heat stress cases of dairy animal and the heat load as calculated by the THI. I have inroduced my new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature as follows:

TGWB Index = 0.78 (Tg + Twb) + 35.8

This newly developed index was validated by using large databases and was found to be highly correlated to the temperature humidity index (THI). TGWB Index differs from other indices that have been suggested in the past for two main reasons. First, new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature, aside from using temperature

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SOCIO-TOXICOLOGICAL SURVEY TO IDENTIFY THE ARSENIC PRONE AREA IN FAIZABAD DISTRICT OF EASTERN UTTAR PRADESH

Yadav JP[1],Varma R[2], Kant R[3], Saif Md.[4], Kumar P[5] and Kumar R[6]

[1]M.V.Sc. Scholar, Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[2] Professor Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry , Sardar Vallabh Bhai Patel University of Agriculture and Technology, Modipuram, Meerut, U.P. India,

[3]Assistant Professor, Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[4]Ph.D. Scholar, Department of Veterinary Pharmacology and Toxicology, DUVASU Mathura U.P. India,

[5]Assistant Professor, Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[6]Assistant Professor, Department of Veterinary Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India

Abstract

Arsenic in drinking water is the major cause of arsenic toxicity. Most of the reports highlighted chronic Arsenic toxicity in animals is increasing. In contrast inorganic arsenic compounds are well known as animal and human carcinogens, based on sufficient evidence in carcinogenicity in animals. From health point of view gastrointestinal effects, anaemia, peripheral neuropathy, skin lesions, hyper pigmentation, liver and kidney damage in animals and humans are common findings in arsenicosis. Inorganic exposure in animals by the inhalation has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in animals has been linked to a form of skin cancer and also to bladder, liver and lung cancer. A socio-toxicological survey was conducted in order to find out arsenic prone area in Faizabad district. Survey report showing Arsenic contamination in water, soil and poultry meat of Faizabad district (73% Veterinary/human hospitals/farmers informed about the contamination) as depicted in table no.1. This helps in the selection of centers. After survey and collection, samples were analyzed in laboratory. 80 samples each of water, soil and poultry meat collected from different locations of Faizabad districts were analyzed for detection of arsenic level. Arsenic contents of samples were detected by Hydride Generation Atomic Absorption Spectrophotometer (HG-AAS). The average arsenic contents of water, soil and poultry meat of different areas are 0.00550±0.00304 µg/g, 5.5500±2.9810 µg/g and 0.17924±0.05247µg/g respectively.Correlation analysis showed a significant positive correlation between drinking water, soil and poultry meat (Correlation coefficient $r=0.623$, $p<0.01$) and correlation was also found positive at (Correlation coefficient $r=0.497$, $p<0.05$). On the basis of above observation and results this can be concluded that periodical survey, study and monitoring of level of arsenic in water, soil & poultry meat is essential.

Keywords: Arsenic,Hydride Generation Atomic Absorption Spectrophotometer (HG-AAS).

Introduction

Arsenic is a widespread pollutant in various regions of the world (Flora *et al.*, 2005). Weathering of rocks converts arsenic sulfides to arsenic trioxide, which enters the arsenic cycle as dust or by dissolution in rain, rivers, or groundwater (Mandal and Suzuki, 2002). The occurrence of high concentrations of arsenic in groundwater used for drinking purpose has been recognized as a major public health concern in several parts of the world. Arsenic has been found to accumulate in the plant tissues and results in reduction in their biomass (Drlickova *et al.*, 2013).

The World Health Organization (WHO, 2007) permissible limit for arsenic is 0.01mg/l for drinking water and FAO permissible limit is 0.10mg/l for irrigation water (Bhattacharya *et al.*, 2009; Ahsan and Del Valls, 2011), whereas the concentrations of arsenic in non-contaminated soils range from 0.1to10mg/kg (Kabata-Pendias and Pendias, 1992). The immediate and long-term impact of using arsenic contaminated water for irrigating paddy soils is a burning concern as arsenic can transfer from water to soil and several studies have proven this phenomenon. It is seen that the total exposure of arsenic to humans and animals is the sum total of exposures from the diet, drinking water, direct ingestion of soil and dust, inhalation and percutaneous absorption (WHO, 2000; Hopenhayn, 2006). The areas across the Gangetic plains in India and Nepal also recently reported as the area affected from Arsenic (Maharjan *et al.*, 2005). Drinking water is the primary and main route of exposure to arsenic. Maximum Permissible Limit(MPL) is the standard concentration of arsenic in drinking water which is not hazardous, is set by the US EPA at 10µg/l (EPA, 2001) and the value for concentration of arsenic in drinking water is recommended by the WHO is also 10µg/l (WHO, 1992). In West Bengal (India), the arsenic concentration in drinking water is about 60 to 3700µg/l and about 40 million people are affected from it (Acharyya, 2002). In middle Ganga plain, Bihar, 206 tube wells (95% of total) were analyzed for arsenic content and showed that 56.8% tube wells have exceeded arsenic concentration of 50µg/l and 19.9% have more than 300µg/l (Chakraborti *et al.*, 2003; Acharyya *et al.*, 1999). Arsenic may be present in the organic or inorganic form (Ahmed, 2003). Of the inorganic forms, arsenite (trivalent) and arsenate (pentavalent) are the two most prevalent and potential dangerous forms, while organic form of organoarsenicals is also important (Dopp *et al.*, 2004; Sharaf *et al.*, 2013).

Himalayan Mountain and Tibet plateau are considered as the biggest source of arsenic contamination in the Gangetic region and this contamination is evidently becoming life threatening in almost every year (Chakraborti *et al.*, 2009). Geographically Uttar Pradesh is situated in the northern region of India and border of Nepal and comes under upper and middle gangetic plain. The river Ganga and Ghaghara are two major river flows from northeast to southeast. Arsenic was introduced as a contaminant in Ballia district of U.P. for the first time in 2003 (Yasunori *et al.*, 2012). Status of Arsenic Contamination in Eastern U.P.: In U.P. Jal Nigam and UNICEF combinedly reported and identified in 18 districts. Arsenic above the 10 ppb limit for drinking and Arsenic according to WHO limit was found in 31 districts (Chaurasia *et al.*, 2015; WSSO U.P. 2011). Times of India also reported "Ground water arsenic contamination of Uttar Pradesh exceeds to the value of BIS (Bureau of Indian Standards) permissible limit of 0.01 mg/liter across 31 districts of the state.

Pandey *et al.* (2015) reported alarming situation and highly contaminated districts are Bahraich, Ballia and Lakhimpur Kheri among than Ambedkar Nagar, Bareli, Basti, Bijnaor, Chaudauli, Faizabad, Ghazipur, Gorakhpur, Meerut, Sant Ravidar Nagar, Shahjahanpur, Siddarth Nagar, Sitapur, Unnao and Kanpur (Yasunori *et al.*, 2012).

Materials and Methods

This study was designed to **identify the** different **arsenic prone** locations in Faizabad district **of eastern Uttar Pradesh.** The major objectives were: –

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; SP4: 72-80

(Special Issue -4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 21-24 December, 2018)

Pharmacological properties of *Boerhavia diffusa*: A review

Rajesh Kumar, S Gautam, KD Singh, P Kumar, Nilufar Haque, Vibha Yadav, R Kumar, RP Diwakar, Rishikant and SB Kumar

Rajesh Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

KD Singh
Department of Instructional Livestock Farm Complex CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

P Kumar
Department of Veterinary Biochemistry and Physiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Nilufar Haque
Department of Vety, Biochemistry and Physiology, SDAU, SK Nagar, Gujarat, India

Vibha Yadav
Department of Veterinary Microbiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

R Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

RP Diwakar
Department of Veterinary Microbiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Rishikant
Department of Veterinary Pharmacology and Toxicology CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

SB Kumar
Department of Soil Science and Agril. Chemistry, BAU, Ranchi, Jharkhand, India

Correspondence
Rajesh Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Abstract
Now a day due to various side effects of allopathic medicine, scientists of pharmaceutical industries and research centers have been engaged to explore the pharmacological properties of herbal plants. The present review explains the pharmacological properties of *Boerhavia diffusa* plant. This plant commonly known as punarnava, is herb of family Nyctaginaceae. *B. diffusa* known to have medicinal properties and used as Ayurvedic medicine in India. Battery of phytochemicals like alkaloids, flavonoids, rotenoids and phytosterols has been found in the plant which are responsible for its various pharmacological properties such as analgesic, anti-*inflammatory*, diuretic, hepatoprotective, immunomodulator and nephroprotective, antiulcer and antihistaminic etc. Moreover, several new phytochemicals are discovered which again validate its medicinal importance. This review presents the evidence-based pharmacological properties of *B. diffusa*. In conclusion *B. diffusa* contain many bioactive phytochemicals that may be use as prophylactic as well as for cure of various ailments of human and animals.

Keywords: *Boerhavia diffusa,* bioactive phytochemicals, pharmacological properties, hepatoprotective and Immunomodulator

Introduction
Boerhavia diffusa, a perennial herb with stout root stock and many procumbent branches, flowers pale rose coloured, small, short-stalked; fruits highly viscid and one-seeded with many vernacular names viz. Punarnava, Raktapunarnava, Shothaghni, Kathillaka, Kshudra, Varshabhu, Raktapushpa, Varshaketu amd Shilatika in India. The genus *Boerhavia* (often spelled as Boerhaavia) was named in honor of Hermann Boerhaave (1668–1738), an eighteenth century Dutch botanist, humanist and physician at the University of Leiden, while the species got the name from typical diffuse branching. The botanical name of the plant is often written in the literature as *Boerhaavia diffusa* (Hiruma-Lima *et al*., 2000) [33], but Linnaeus Latinized Boerhaave's name to Boerhavius and adopted the spelling *Boerhavia diffusa*, which is the correct spelling to be used (Spellenberg, 2004) [75].
Punarnava is a very important medicinal herb of Ayurveda. Its name is derived from two words, *Punar* (= once again /regaining/restoring) and *Nava* (=new, renew or young), so the literal meaning of the name is, one which becomes new or young again. This name signifies the rejuvenating property of Punarnava. It is a Rasayan herb of Ayurveda which renews the body or restores youth.

***Boerhavia diffusa* (Punarnava)**	
Kingdom	Plantae
Division	Angiosperm
Class	Eudicots
Order	Caryophyllales
Family	Nyctaginaceae
Genus	*Boerhavia*
Species	*diffusa*

RESEARCH ARTICLE

Impact of Different Therapeutic Protocols on Blood Biochemical Markers and Fertility in Anestrus Sahiwal Cows

Safayat Husain[1], Rajesh Kumar[1]*, Bhoopendra Singh[1], Sushant Srivastava[1], Rabindra Kumar[1], Pramod Kumar[2], Nilufar Haque[3]

Abstract

Bovine anestrus syndrome is a multifactorial disorder of the reproductive system. The problem is severe in suburban and rural areas of the country. The present study was aimed to evaluate the effect of different therapy on biochemical parameters and fertility response in 24 anestrus Sahiwal cows. Anestrus cows were randomly divided into four equal groups of six animals each, and were subjected with Lugol's iodine 2%, cervical painting with per rectal massage of genitalia thrice on alternate day (G1, n=6), XXX herbal bolus 1 bid for 2 days, repeated on day 11 & 12 later in non-respondents (G2, n=6), and modified ovsynch protocol which consisted of 100 mg hydroxy progesterone caproate injected daily s/c for 6 days followed by inj. GPG (G3, n=6), while one group was kept as untreated control (G4, n=6). Blood samples were collected thrice from all cows, *i.e.*, pretreatment day-0 (S1); post-treatment at induced estrus/AI (S2) and day 21 post-AI (S3), for estimation of serum progesterone and biochemical constituents. In general, except progesterone, the mean values of serum glucose, total cholesterol, total protein, albumin, calcium and phosphorus were significantly ($p<0.05$) lower at d-0 than the corresponding values at induced estrus and day 21 post-AI in treatment groups G1, G2 and G3; whereas, the periodic values did not differ significantly in control group G4. The estrus induction response was 100% in all treated cows with comparable conception rates among different therapeutic protocols (83.33, 66.66 & 83.33 %) as against nil response in control group G4. The results suggest that bovine anestrus syndrome can be managed well with comparatively low-cost Lugol's iodine and herbal therapeutics.

Keywords: Anestrus, Biochemical parameters, Estrus induction, Sahiwal cows, Therapy

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.4.11

Introduction

Bovine anestrus syndrome is a multifactorial disorder of the reproductive system, characterized by the absence of estrus either due to lack of estrus or failure of its detection. The problem is severe in suburban and rural areas of the country. Wide variation in the incidence of anestrus has been reported in cattle and buffalo across the country (Butani *et al.*, 2008 and Ashoo *et al.*, 2020). The clinical syndrome can be diagnosed using anamnesis, ovarian palpation, progesterone estimation, and ultrasonography; being multifactorial, it can be treated according to their cause; however, there is no single panacea to correct it. Many non-hormonal and hormonal drugs have been tried and tested to treat anestrus syndrome (Kumar et al., 2011; Dhami et al., 2015; Kumar *et al.*, 2020; Kumar *et al.*, 2021). Among herbal therapeutics, various types of tropical plants are used traditionally to augment reproductive performance. Some plants contain secondary metabolites which are effective in inducing estrus in post-partum anestrus cows. The hormonal drugs being costly cannot always be affordable under field conditions. Thus, the present study was aimed to assess comparative efficacy of Lugol's iodine, XXX bolus (herbal heat inducer) and modified ovsynch protocol on fertility response in post-partum anestrus cows and its effect on blood biochemical profile.

Materials and Methods

The study was carried out under farm conditions during the year 2019-20 in the semi-urban areas of Ayodhya district in UP, India. The experimental protocol was approved by Institutional Animal Ethics Committee of the College. At preliminary stage, 34 cows were selected on the basis of history, breeding records and per-rectal examination. The

[1]Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, UP-224229.

[2]Department of Veterinary Physiology & Biochemistry College of Veterinary Science & Animal Husbandry Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, UP-224229.

[3]Directorate of Research Extension & Farm, WBUAFS, Kolkata, West Bengal, India

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, ANDUAT, Ayodhya, U.P., India, e-mail: drrajesh25@gmail.com

How to cite this article: Husain, S., Kumar, R., Singh, B., Srivastava, S., Kumar, R., Kumar, P., & Haque, N. (2021). Impact of Different Therapeutic Protocols on Blood Biochemical Markers and Fertility in Anestrus Sahiwal Cows. Ind J Vet Sci and Biotech, 17(4), 49-53.

Source of support: Nil

Conflict of interest: None.

Submitted: 20/03/2021 **Accepted:** 21/08/2021 **Published:** 10/10/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 281-285

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 281-285
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of α-Tocopherol Acetate and Zinc Supplementation on Milk Composition in Crossbred Cows

Pankaj Kumar Maurya[1*], Anjali Aggarwal[2], P. K. Choudhary[1], A. K. Verma[1] and Pramod Kumar[1]

[1]College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP), India
[2]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001, Haryana, India
**Corresponding author*

Keywords

Milk composition, Somatic cell count, Transition period, α-tocopherol acetate, Zinc

A B S T R A C T

The study was conducted to investigate the effect of α-tocopherol acetate and zinc on milk composition in Karan Fries cows. Twenty pregnant Karan Fries cows were selected two months before expected date of calving. The experimental animals were randomly divided in to two groups namely control group (ten cows) and treatment group (ten cows). Treatment group cows were supplemented with α-tocopherol acetate @ 1000 IU/day/cow and zinc @ 60 ppm/day/cow. Milk fat % was lower in treatment group than control group but the overall fat in treatment group was found significantly higher than control group (4.47±0.20 vs. 3.95±0.27, P<0.01). The overall mean milk protein % was found 3.08±0.04 vs. 3.05±0.11, milk lactose % 4.47±0.08 vs. 4.48±0.10 and SNF % 8.17±0.15 vs. 8.15±0.17 in control group and treatment group, respectively which showed that there was no significant difference between the groups. The overall mean (±SEM) of somatic cell count of milk was found significantly lower (P<0.001) in treatment group than control group. The results of this study indicated that supplementations of antioxidants like α-tocopherol acetate and zinc have beneficial effects in improving quality of milk.

Introduction

For good quality dairy products there is need to know the quality aspects of milk produced. Since the diet is the fastest way to modify the milk production and quality in animals, even if the relations between the feeding and milk composition are quite complex. Trace elements, along with vitamins and minerals, are essential nutrients for cellular metabolism. They are critical components of almost every aspect of how a body grows, develops, functions and reproduces. Vitamin E is crucially involved in immune system function, such that supplementation with supranutritional levels of the vitamin E, results in improved immune responses and milk production (Chawla and Kaur, 2005; Baldi, 2005; Baldi *et al.*, 2008; Chandra and Aggarwal, 2009). There was significant decrease of somatic cell count (SCC) in milk at 15 days of lactation (0.29×10^6 vs. 0.86×10^6) in cows supplemented with 1000 IU vitamin E / day during dry period (Kaur *et al.*, 2002). The somatic cell count is internationally recognized as a parameter for assessing the milk quality and udder health. The present

RESEARCH ARTICLE

Effect of Exogenous Melatonin and Different Photoperiods on Differential Leucocyte Count in Chhotanagpuri Ewe

Pankaj K. Choudhary[1]*, Ajay K. Ishwar[2], Pramod Kumar[1], Pankaj K. Maurya[1], Mukesh Kumar[3], Rajesh Kumar[4], Debasish Niyogi[5]

Abstract

Forty-two healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging from 14.11 ± 0.09 to 15.38 ± 0.06 kg, were selected and isolated from rams 2 months before melatonin administration. The selected animals were allocated randomly into seven groups each of 6 animals, *viz.*, Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + melatonin administration 3 mg/day orally], Group-IV [(LD + melatonin administration s/c @ 1 mg/day], Group-V [Short day (SD) control], Group-VI [SD + melatonin administration 3 mg/day orally] and Group-VII [SD + melatonin administration s/c @ 1 mg/day]. Rams were then introduced into each group after completion of exogenous administration of melatonin for one month. Blood samples without anticoagulant were collected from each animal a day before the experiment and then every month till the fifth month. Among different periods, lymphocyte % in the third and fourth months of the experiment was significantly ($p < 0.05$) lower in all groups (group-I to VII) in comparison to 0 days, first, and second months. In the fifth month, lymphocyte % was significantly ($p < 0.05$) higher in group III, IV, VI, and VII compared to the third and fourth months of the experiment. Neutrophil % in the third and fourth months of the experiment was significantly ($p < 0.05$) higher in all groups in comparison to 0 days, first, and second months. In the fifth month, neutrophil % was significantly ($p < 0.05$) lower in group III and VI than in the third and fourth months. Monocyte % was significantly ($p < 0.05$) higher in group III and IV than group VII at first month. In the third month, monocyte % was significantly ($p < 0.05$) higher in group IV and VI than in group I and group II.

Keywords: Chhotanagpuri Ewe, Differential leucocyte count, Exogenous Melatonin, Photoperiod.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.2.00

Introduction

The major functions of the white blood cells and their differentials are to fight infections, defend the body by phagocytosis against invasion by foreign organisms, and produce or at least transport and distribute antibodies in immune response (Etim, 2015). Thus, animals with low white blood cells are exposed to a high risk of infection. In contrast, those with high counts are capable of generating antibodies in the process of phagocytosis and have a high degree of resistance to disease (Soetan *et al.*, 2013) and enhancing adaptability to local environment and disease prevalent conditions (Isaac *et al.*, 2013). According to Etim *et al.* (2014) immune status is a function of leucocytes, lymphocytes, and neutrophils. Lymphocytes are known to play critical roles in the immune defense system of both men and animals (Etim *et al.*, 2014[b]).

Melatonin signaling is necessary for photoperiodic adjustment in immune responses; it is difficult to parse the direct differential effects of melatonin on immune cells from indirect modulatory actions on other neuroendocrine axes, including the systems that control gonadal and adrenal steroids. However, the hypothesis that melatonin acts on immune function via downstream hormonal effects has not been born out, as gonadectomy and steroid replacement has minimal effect on photoperiodic plasticity in the immune system (Prendergast *et al.*, 2005).

Exogenous melatonin administration increased the total leucocytic count and lymphocyte percentage in squirrels (Rai

[1]Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[2]Department of Veterinary Physiology, Ranchi Veterinary College, Birsa Agricultural University, Ranchi-834006, Jharkhand, India.

[3]Department of Veterinary Anatomy and Histology, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[4]Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[5]Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

Corresponding Author: Pankaj K. Choudhary, Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India., e-mail: drpankajvet2003@gmail.com

How to cite this article: Choudhary, P.K., Ishwar, A.K., Kumar, P., Maurya, P.K., Kumar, M., Kumar, R., & Niyogi, D. (2021). Effect of Exogenous Melatonin and Different Photoperiods on Differential Leucocyte Count in Chhotanagpuri Ewe. Ind J Vet Sci and Biotech, 17(2): 1-5.

Source of support: Nil

Conflict of interest: None.

Submitted: 00/00/2021 **Accepted:** 00/00/2021 **Published:** 00/00/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 2309-2312

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2309-2312
Received: 09-01-2018
Accepted: 10-02-2018

Rishi Kant
Assistant Professor, Department of Veterinary Pharmacology and Toxicology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Correspondence
Rishi Kant
Assistant Professor, Department of Veterinary Pharmacology and Toxicology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Effect of *Withania somnifera* on Monocrotophos toxicity in commercial Poultry

Rishi Kant, RP Diwakar and Pramod Kumar

Abstract
The present study was conducted to investigate the protective efficacy of aqueous extracts of root and leaves of *W.somnifera* (Ashwagandha) against monocrtophos toxicity in broilers. Seventy two day old broiler chicks, were divided randomly and equally into six groups viz. Group I (Untreated Control), group II(MCP Control), *W. somnifera* root extract was given daily@ 100 and 300(mg/kg b.wt., orally) to group III and IV respectively in drinking water, *W. somnifera* leaf extract was given daily@ 100 and 300(mg/kg b.wt., orally)to group V and VI respectively in drinking water. On 21 day group II,III, IV, V andVI were administered single oral dose of MCP @ 1.34mg/Kg b.wt.($1/5^{th}$ of LD_{50}). There was no significant difference in haematological parameters in any of the experimental groups of birds after 1 day of single monocrotophos treatment except TEC which was significantly reduced in group II in comparison to group I birds. After 7 days there was a significant ($P<0.05$) decrease in the values of Hb, TEC and % lymphocytes in group II birds in comparison to group I birds. After 7 days *W. somnifera* root and leaf extract could not change the altered value of Hb to normal in groups III to VI, however leaf extract increased the depleted values of TEC and of % lymphocytes in group V and VI.
Monocrotophos significantly increased the activities of ALT, AST and ALP after 1 day of monocrotophos exposure in group II in comparison to group I birds. *W. somnifera* root and leaf extract significantly decreased ($P<0.05$) the values of these enzymes in the birds of group III to VI. In addition to that, root extract also reduced the value of serum creatinine, total protein and albumin in group IV in comparison to group II. Other parameters like globulin level, A:G ratio and activity of LDH remain unchanged. After 7 days of monocrotophos treatment activities of ALT, LDH and creatinine level were increased significantly in group II as compared to group I birds. The AST and ALP activities were unaltered in group II as compared to group I birds. Root and leaf extract showed their potential by decreasing the activity of ALT significantly in group III to VI birds in comparison to group II. However, the extract could not ameliorate the toxic effect of monocrotophos on LDH activity and creatinine level. The other biochemical parameters were unaltered.

Keywords: Monocrotophos, Ashwagandha (*Withania somnifera*) root and leaf extract

1. Introduction
Monocrotophos is an organic ester of phosphorus, which has the ability to inhibit the AChE. It is widely used to control insects and pests of rice and other crops and ectoparasiticide in animal husbandry practices (WHO 1993) [16]. Exposure of poultry to monocrotophos causes health consequences to poultry culminating in great economic loss, while also posing a potential threat to public health due to presence of pesticide residue in poultry meat (Pal and Kushwah, 1998, 2000) [8, 9]. Chronic exposure of chicks to small amount of organophosphates leads to deleterious effects on metabolism and immune system of birds (Garg *et al.* 2004) [2, 3]. Pharmacological screening of *W. somnifera* reveals that it is used as a tonic, stimulant, alterative, aphrodisiac, diuretic and abortifacient. Prolonged medication with *W. somnifera* caused a positive effect on weight, feed consumption, general resistance, liver weight and antistress effects in men and animals (Rao *et al.*, 1999, Archana and Namasivyam, 1999) [10, 1]. The present study was conducted to investigate the protective efficacy of aqueous extracts of root and leaves extract of *W. somnifera* in poultry exposed to monocrotophos.

Materials and Methods
Preparation of root and leaves extracts
After collection the plant materials were shade dried and powdered. The powders were further processed for aqueous extraction. The powder was soaked in distilled water for 24h with intermittent stirring at 40 °Cwith the help of magnetic stirrer. The infusions were filtered through muslin cloth and centrifuged at 400g for 15 minutes to get the supernatant. The filtrates were dried with the help of incubator with fan and lypholizer (37 °C) to get the final extracts.

GROSS AND HISTOLOGICAL STUDIES OF THE URETER IN *MARWARI* SHEEP (*Ovis aries*)

Krishna Nand Singh[1], Sanjeev Joshi [2], Rakesh Mathur[2], Mukesh Kumar[1], Pramod Kumar[1], S.S. Sengar[1] K. K. Tripathi[1] and Rakesh Gupta[3]

1. Asstt. Professor, C. V. Sc & A.H., N.D.U.A & T., Kumarganj- Faizabad (U.P.)
2. Department of Veterinary Anatomy and Histology, CVAS, Bikaner.
3. P.G. scholar Department of Veterinary Pathology, C. V. Sc & A.H., N.D.U.A & T.

Abstract

The present study was conducted on ureters of 15 *Marwari* sheep of either sex between the ages of 1.5 -2 years. It was a long and thin muscular tube begins from renal pelvis at the hilus and passes backward along medial border of kidney. In the Histological structure ureter was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance. Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles. The outer layer tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings.

Key words: Ureter, Stellate Lumen, transitional epithelium, smooth muscle fiber.

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. The present investigation has been planned to study the gross and histological structure of the ureter to justify its importance and essentiality in the body. In mammals the ureters are the chief excretory ducts of the body.

Materials and Methods

The Gross study was conducted on 15 apparently healthy adult *Marwari* Sheep (*Ovis aries*) of either sex. The Ureters from the freshly slaughtered animals were procured from Municipal slaughterhouse, Bikaner.

For the histological examination the small pieces of tissues (2 mm size) were collected from 12 ureters (6 right and 6 left). From each, the tissues were collected from different anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs, Bouin's fluid for 12 hrs, and Zenker's fluid for 18 hrs (Singh, U.B. and Sulochana, S. 1996). Fixed tissue was latter washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60℃, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the histological stains (Luna, L.G. 1968). to demonstrate different histological structures of ureters.

Results and Discussion

Each kidney was connected to the urinary bladder by a ureter. It was a long and thin muscular tube begins from the renal pelvis at the hilus and passes backward along medial border ofthe kidney. It passes ferther caudally and enters in tothe pelvic cavity. It inclines inward and downward and open in to the bladder at the caudodorsal aspect. Similar findings were also reported by Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals.

In the histological structure the ureter of Marwari sheep was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance (Dellmann HD, 1993). Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres which was dense towards the epithelium and loose towards the muscularis mucosa. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles (Fig1. and Fig 2.). The outer layer, the tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings. Similar findings were also reported by Doaa Zaghloul *et al* in Camel, Woldemeskel *et al.* (1998) in sows and Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals. Whereas A.R. Sreeranjini *et al* (2010) found that the sub mucosa of intra renal ureteric branches and ureter in Japanese quail contained collagen, elastic and reticular fibers. Tunica muscularis of ureter contained few elastic fibers among smooth muscle fibers. Tunica adventitia was comprised of loose connective tissue containing collagen and elastic fibers.

References

1. **A.R. Sreeranjini, M. P. Iyyangar and D. Pramod kumar (2010).** HISTOLOGICAL STUDY ON THE FIBROUS ARCHITECTURE OF KIDNEY AND URETER OF JAPANESE QUAIL (COTURNIX COTURNIX JAPONICA) * Tamilnadu J. Veterinary & Animal Sciences 6 (2) 107-110, March - April 2010.
2. **Dyce, K. M.; Sack, W. O. and Wensing C. J. G. (2010).** Textbook of veterinary anatomy 4th ed[n]. Saunders Comp. Philadelphia. pp: 181.
3. **Dellmann HD**. Text book of veterinary histology. 4th Edn. Lea and Febriger, Philadelphia, USA, 1993, 194-212.
4. **Doaa Zaghloul, Shireen Hafez and Thomas Caceci (2013)** Microscopic anatomy and ultrastructure of the Camelus dromedarius ureter Eur. J. Anat. 17 (4): 202-208 (2013).
5. **Konig, H. E. and Liebich, H. G. (2006).** Veterinary anatomy of domestic animals, 3rd ed[n], Schattauer, Stuttgart, Germany, pp: 375-376.
6. **Luna, L.G. (1968).** Manual of histological staining methods of the Armed Forces Institute of Pathology. 3rd ed. Mc Graw - Hill Book Company, New York.
7. **Singh, U.B. and Sulochana, S. (1996).** Handbook of Histological and Histochemical Techniques. 2nd ed. 5 -1-800, Kothi, Hyderabad, Andhra Pradesh, India. Premier Publishing House.
8. **Woldemeskel M., Drommer W. and Wendt M. (1998).** Histology and ultrastructure of the urothelium lining the ureter and the renal pelvis in sows Anatomia, histologia, Embryologia 27 (1), 51-55, 1998.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 1220-1221
© 2019 JEZS
Received: 19-09-2019
Accepted: 21-10-2019

Sandeep Yadav
M.V.Sc. Scholar, Department of Veterinary Medicine, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Vibha Yadav
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology& Biochemistry, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Management of traumatic proptosis in a pug: A case study

Sandeep Yadav, Vibha Yadav, RP Diwakar and Pramod Kumar

Abstract
A three years old male pug dog, weigh 10 kg was presented to Jai Pet Care Clinic Raebareli, Uttar Pradesh for treatment with unilateral traumatic proptosis. All clinical parameters were normal. Physical examination revealed partial prolapse of right eye globe with severe periorbital edema, haemorrhage, absence of menace and presence of miosis. Therapeutic management done by administration of triflupromazine @4mg/kg I/M for sedation, dexamethasone and gentamicine 0.2ml each in combination injected through intra palpebral route, which was repeated on 5th day. Animal was also given intramuscular injection of gentamicin @5mg/kg, dexamethasone @0.125mg/kg, vitamine B complex 2.0 ml and chlorpheniramine maleate @0.5mg/kg only once for 5 consecutive days. Eye drop of moxifloxacine and dexamethasone 4 times a day for instillation, chloramphenicol ointment 4 times a day for local application and enrofloxacin @5mg/kg orally once for 7 days were used. Animal recovered successfully after 7 days of regular treatment. Vision was assessed by simple vision testing using junction box, after 15 days of recovery and found normal.

Keywords: Pug, proptosis, therapeutic management

Introduction
Proptosis is forward displacement of globe which occur secondary to any blunt trauma to head [7]. Proptosis typically occurs in dogs following trauma to the face or head. Certain breeds of dog are more prone to eye proptosis than others because of their differences in facial conformation. The most common cause of proptosis in small breed dogs is a fight with a larger dog. During trauma, the globe is luxated from the orbit, and eyelid spasms prevent its retraction. Secondary orbital hemorrhage and swelling displace the globe further from the orbit following corneo-conjunctival drying and malacia [3]. Prognosis depends on pupil size and reflexes, duration of exposure, other globe or orbital damage, breed and other systemic trauma. Approximately 40–60% of dogs, but very few cats, recover vision. Traumatic proptosis can occur in any breed and in both dogs and cats. Only 20-40% of dogs that have the reattachment of the eyeball regain their vision.

Case history and observations
A three year old male pug of 10 kg weight was presented at Jai Pet Care Clinic Raebareli, Utter Pradesh with unilateral traumatic proptosis having recent history of blunt head trauma by hitting head against the wall. Clinical examination revealed partial prolapse of right eye globe (fig.-1) through the pulpebral fissure with severe periorbital edema (fig.-2), haemorrhage without fracture of skull. There was absence of menace and presence of miosis. Corneal examination revealed concurrent finding of pigmentary vascular keratitis. All clinical parameters of the pug were normal.

Fig 1: Unilateral partial proptosed globe in a pug

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; SP6: 688-690

Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

SK Pandey
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Subhash Chandra
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Divya Singh
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Rajendra Prasad
Department of Plant Pathology, Narandra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

In vivo evaluation of bio agents, botanical and fungicides against *Fusarium oxysporum* f. sp. *basilica*

Rajendra Prasad, S.K. Pandey, Subhash Chandra, Neeraj Kumar Rajvanshi and Divya Singh

Abstract
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. For the management of wilt disease of Holy Basil (*Ocimum sanctum*) the experimental finding depicted in Table no.3 reveal that among 6 treatment which include three bio-agent T_1 *Trichoderma viride*, T_2 *Trichoderma harzianum* and T_3 *Pseudomonas fluorescence* and one botanicals T_4 Neem leaves and two chemicals T_5 Tebuconazole and T_6 Mancozeb. The most effective was Tebuconazole 250 EC @ 0.1% with percent disease control and percent disease intensité, (68.20) and (19.67) respectively. And Mancozeb 75WP @ 0.1%. With PDC and PDI (62.54) and (23.17), respectively where as the bio-agent *Trichoderma viride* Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. Distilled water) with PDC and PDI (45.41) and (33.75), respectively. *Trichoderma harzianum* (Talc based formulation was prepared.cfu-1×10^9/gm and dissolved @ 10gm in 1.0 lit. distilled water) with PDC and PDI (37.02) and (38.94) respectively and *Pseudomonas fluorescence* @ 4 gm/kg seed with PDC and PDI (27.76) and (44.62) respectively. and Neem leaves @ 5% with PDC and PDI (16.98) and (51.53).The used fongicide and bio pesticide significantly reduce the wilt of *Ocimum sanctus*.

Keywords: Tulsi, *Pseudomonas fluorescence,* Tebuconazole

Introduction
The Holy Basil (*Ocimum sanctum* Linn.) commonly known as Tulsi, is an aromatic perennial plant, belongs to the family Liliaceae. It is native to Indian subcontinent and wide spread as a cultivated plant throughout the south-east Asian tropics. Holy Basil is widely grown in India for medicinal as well as religious purposes. There are many species of Basil such as *Ocimum sanctum* L.(Tulsi), *Ocimum gratissimum* (Ram Tulsi), *Ocimum canum Sims* (Dulal Tulsi), *Ocimum basilicum* (Ban Tulsi), *Ocimum kilimandscharicum Gureke (*Camphor Basil*) and Ocimum americanum* Linn *(*Hoary Basil) among them holy Basil *(Ocimum sanctum)* has been well known for its therapeutic potential (Prakash and Gupta, 2005) [2].The chemical constituents present in *Ocimum sanctum* are Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool and β-caryophyllene, β-elemene (Kothari *et al*.2004) [1] In several ancient system of medicine including Ayurveda, Greek Roman, Siddha and Unanni, *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy,

doi: 10.5958/0974-0163.2019.00064.8

Evaluation of Pigeon pea genotypes for resistance to *Fusarium* Wilt

Subhash Chandra, Neeraj Kumar Rajvanshi, Ajay Kumar, Kumari Punam* and Ramesh Chand**

*Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya – 224 229 (U.P.), *Department of Botany, J. P. University Chhapra (Bihar)*
***Department of Nematology, ND.U.A.&T., Kumarganj, Ayodhya – 224 229(U.P.), India*
<chandrasubhash75@yahoo.in>

Pigeon pea (*Cajanus cajan* L.) is widely adaptable to wide variety of climate and is one of the important legume crops of tropics and subtropics. It played a major role in nutritional security for the people taking cereal based diet. Beside their dietary value and nitrogen fixing ability, pulses also play an important role in sustaining intensive agriculture by improving physical, chemical and biological properties of soil and are considered excellent crop for diversification of cereal based cropping system.

Wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeon pea in India leading to heavy production losses. The *F. udum* is host specific to pigeon pea (Patel *et al*., 2011) and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. For developing resistant varieties, resistant source are the basic requirement. Therefore, the present investigation was undertaken.

Seeds of 58 germplasm of Pigeon pea were obtained from the Department of Genetics and Plant Breeding, N.D.U.A.&T., Ayodhya and ICAR-IIPR, Kanpur. The germplasms were screened under sick plot technique. The plots (sick soil) showed over 90% wilt incidence in susceptible cultivar Bahar of Pigeon pea was used as test variety. After germination, observations were recorded regularly up to 60 days for the appearance of wilt symptoms and severity. The disease was recorded using 1-9 scale for the wilt disease.

Fifty eight germplasms of Pigeon pea were screened for their reaction to *Fusarium udum* in sick plot. It is evident (Table 1) that out of 58, 6 germplasms *viz*.; AKT 201030, IPA 96, IPAF, IPA 204, JSA 59 and WRGE 18 were found resistant, attributing to the higher concentration of phenol as observed by Haldar and Srinivasan (2007), 5 moderately resistant, 10 tolerant, 16 moderately susceptible and 21 germplasm were highly

Table 1. Performance of Pigeon pea genotypes against *Fusarium udum* under field condition (Sick plot technique)

Reaction (Rating scale)	Name of the genotypes
Resistant (1)	AKT201030, IPA96, IPAF, IPA204, JSA59, WRGE18.
Moderately resistant (3)	IPA9F, IPA204, ICP8863, WRGE18, BDN2.
Tolerant (5)	IPA13F, AL1573, H2001-4, HDM04-1, UPAS120, GRG206, JKM197, PT02-9, IPA2F, IPA4F.
Moderately susceptible (7)	IPA12F, WRG123, JKM206, JKM208, PT02-5, PT25-6, AL1514, AL1571, PA325, PT05-37, WPB205, AKT222560, ASI106, JKM209, NDA05-1, WRGE42.
Highly susceptible (9)	IPA11F, IPA14F, IPA15F, IPA34, IPA234, JSA28, PA322, PT01-27, BAHAR, PUSA2006-2, SKN205, WRGE56, CORG990015, PT05-36, IPA1F, IPA3F, IPA5F, IPA5-2, IPA5-3, IPA6F, IPA7F.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(4): 361-362
© 2019 IJCS
Received: 16-05-2019
Accepted: 20-06-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Field evaluation of pigeonpea (*Cajanus cajan*) genotypes against fusarium wilt to disease resistance

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar and Mukesh Kumar

Abstract
The pigeonpea germplasms/genotypes were evaluated to identify the sources of resistance to Fusarium wilt disease. The *F. udum* is host specific to pigeonpea and can survive in soil under wilted plant stubble for a long period. The best way of wilt management is by growing resistant varieties. Out of 54 screened genotypes, twenty one genotypes *viz.* BDN2001-6, BRG2-7, CORG2004-01, CORG990013, H2000-37, H2000-47, IPC7119, IPC8863, IPA14F, JKM186, JKM197, JKM204, JKM205, JKM209, KAWR11, KAWR91, NTL30, PT02-25, PT02-5, PT11-39, and PUSA2005-1 were found resistant, 15 moderately resistant, 13 tolerant, 4 moderately susceptible and 1 genotype were highly susceptible against fusarium wilt. The most susceptible variety Bahar showed 80 per cent wilting.

Keywords: Pigeonpea, *Fusarium,* germplasm, resistant

Introduction
Pigeonpea [*Cajanus cajan* (L.) Millsp.], also referred to as red gram or *arhar,* is a perennial shrub, with its centre of origin located in India. It is an important grain legume crop predominantly grown in the Indian subcontinent as an important source of dietary protein. In India, production of Pigeonpea was 42.54 Lac tones on area of 44.31 Lac ha with yield of 960 kg/ha (Anonymous, 2018) [1]. It is also cultivated in other parts of the world, including sub-Saharan Africa, Latin America, the Caribbean and South-East Asia. Its cultivation is increasing in semi-arid areas because of the crop's ability to thrive under prolonged drought and in degraded lands (Upadhyaya *et al*., 2012) [11]. The crop is mainly grown as annual using cultivars with different durations to maturity: 90 days (Short), 120 days (Medium) and 180 days (Long). It is cultivated as a perennial crop in several regions of India. The shift of pigeonpea cultivation from the traditional *kharif* season to pre *rabi* September sowing in north Bihar has not only shown an increased production potential of this important pulse crop but have also opened altogether a new possibilities in land use pattern of the rain fed areas of Bihar and adjoining states. Fresh pods are consumed as a vegetable; dried mature grains are used for cooking or in processing. Among the several factors responsible for reduction yield and quality deterioration of pigeonpea in India, diseases occupy a vital place. Among the diseases, wilt disease caused by *Fusarium udum* Butler, is the most destructive soil and seed born disease of pigeonpea in India leading to heavy production losses. The disease since been reported from Bangladesh, Ghana, Grenanda, Indonesia, Kenya, Malawi, Mauritius, Tanzania, Thialand, Trinida, Uganda and Zambia. In India it is the most serious problem all over the Pigeonpea growing states especially in U.P., M.P., Bihar and Maharashtra. In the epiphytotic conditions, disease incidence was recorded 15-25 per cent in general and up to 50 per cent (Butler, 1910) [2]. In Bihar and Uttar Pradesh, 5-10 per cent losses in standing crop are common feature every year (Singh, 2006) [10].

Materials and Methods
Seeds of fifty four genotypes of Pigeonpea were obtained from the Department of Genetics and Plant Breeding, N.D. University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) and IIPR, Kanpur. The genotypes were screened under artificial conditions (Sick plot technique) using the methods described by Nene *et al*., (1982) [5].

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 469-471
© 2019 IJCS
Received: 04-03-2019
Accepted: 08-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Screening of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against mungbean yellow mosaic virus (MYMV) under field condition

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, Mukesh Kumar and MP Chauhan

Abstract
Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India it is third most important pulse crop after chickpea and pigeonpea. Mungbean is an important short duration grain legume which is grown in different parts of the country, for grain and green manuring. It is an outstanding source of easily digestible proteins with low flatulence, which balances the staple rice diet in Asia. Mungbean yellow mosaic disease (MYMD) caused by whitefly (*Bemisia tabaci*) transmitted mungbean yellow mosaic virus (MYMV) is an important constraint of mungbean in India. Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, out of fifty two genotypes of mungbean were tested for the resistance against MYMV during *Kharif* 2015 in field condition. The per cent disease incidence (PDI) of MYMV among 52 mungbean genotypes was worked out up to ninth week after sowing and it varied from 0 to 79.68 %. Out of fifty two mungbean genotypes, five were found resistance, eight were moderately resistant, seventeen genotypes were recorded moderately susceptible and twenty two genotypes were noticed susceptible. Five genotypes namely, PM 10-18, PUSA 1371, BM 2012-09, DGGV-2 and MH 810 found resistant during present investigation which can be used for the development of mapping population for the development of MYMV resistant varieties.

Keywords: mungbean, genotypes, resistance and yellow mosaic virus

Introduction
Mungbean (*Vigna radiata* L.) is also known as green gram, green bean, moong, mash bean, golden gram and green soy (Saminathan 2013) [10]. In India, the name green gram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [2]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz*., *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [11]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1]. The standard worldwide yield of mungbean is very low (389 kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus, nematodes and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al*., 2005) [3]. Twelve viral diseases are reported on mungbean crop *viz*., Mungbean yellow mosaic virus (MYMV) disease, Bean yellow mosaic virus (BYMV) disease, Southern bean mosaic virus (SBMV) disease, Leaf crinkle virus (LCV) disease, Mungbean mosaic virus (MMV) disease, Cowpea aphid-borne virus (CABV) disease, Cucumber yellow mosaic virus (CMV) disease, Alfalfa

International Journal of Chemical Studies 2019; 7(3): 466-468

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 466-468
© 2019 IJCS
Received: 01-03-2019
Accepted: 05-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Evaluation of mungbean [*Vigna radiate* (L.) Wilczek] genotypes for resistance against web blight

Subhash Chandra, Neeraj Kumar Rajvanshi, MP Chauhan and Mukesh Kumar

Abstract
Web blight (*Rhizoctonia solani*) of mungbean is a very destructive disease caused by fungus *Rhizoctonia solani*. In India, mungbean crop suffers a great loss due to this disease.Use of resistant genotypes is the best method of avoiding the occurrence of the disease. Keeping this point in view, fifty two genotypes of mungbean were tested for the resistance against web blight in field condition. Out of fifty two genotypes of mungbean were carried out under field condition of natural infection, where twenty nine genotypes *viz*.; BM 2012-09, Palampur 93/kulu-4, LGC 574, NUL 516, T-44, SGC 20, SML 1082 (SC), IPM 312-19, IGKM 06-42, VG 10-008, MH 921, ML 2412, PUSA 571, RMG 1082, PUSA 1472, ML 2410, ML 2333, COGG-912, KM 2348, AKM 12-17, IPM 312-20, GM 11-02, KM 2241, ML 818, HUM-1, CO6, LGG 460, IPM 02-3 and GM 04-02 were found resistant, five genotypes were recorded moderately resistant, thirteen genotypes were noticed moderately susceptible, four genotypes *viz*.; NVL 825, DUG 5, VBN 4, RMG 1028 were recorded susceptible. Only one genotype K-851was found highly susceptible.

Keywords: Evaluation, mungbean, web blight, *Vigna radiate*

Introduction
Mungbean (*Vigna radiata*) belongs to fabaceae family along with good sources of protein, carbohydrates and vitamins for mankind all over the world. Mungbean (*Vigna radiata* L.) is also known as mung, moong, mungo. In India, the name greengram is more commonly used than mungbean (Chatterjee and Randhawa, 1952) [3]. It is third most important pulse crop of India after chickpea and pigeonpea. Mungbean can grow in all three seasons in India, *viz*., *Kharif* (July- Oct), *Rabi* (Sept- Dec) and summer (March- June). It is grown under rainfed condition during *Kharif* and on residual moisture during *Rabi* in eastern and southern part of the country. However, *Kharif* season crop occupies maximum area of its cultivation. Intercropping with sorghum, pearl-millet, maize, cotton, castor, pigeonpea etc., are popular. India alone contributes 54% of world production and covers 65% of the world acreage (Singh, 2011) [10]. It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). It is grown in intercropping, catch cropping and relay cropping systems because of its short duration (less than 60 days). In India, mungbean is grown in an area of 4.32 m ha with production of 2.17 m tones and productivity of 502 kg/ha. Important mungbean growing states are Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha, Bihar, Tamil Nadu, Madhya Pradesh and Uttar Pradesh (Anon, 2018) [1].

Mungbean has been considered as "poor men's protein". It contains 26% protein, 51% carbohydrate, 4% minerals, 3% vitamins and 10% moisture (Khan, 1981) [7]. The standard worldwide yield of mungbean is very low (389kg/ha) and its production has not increased over the year. The main reason for low yield is the susceptibility of the crop to insects, weeds and diseases caused by fungus, virus and bacteria. Among these, the viruses are the most important group of plant pathogens affecting the production of the crop. They cause severe diseases and economic losses in mungbean and reducing seed yield and quality (Kang *et al.*, 2005) [6]. The crop is infected by a large number of pathogens consisting of (virus, bacteria, fungi and nematodes) which significantly contribute to poor yields. Among the diseases, Yellow mosaic, Web blight, Bacterial blight, Leaf crinkle, Powdery mildew, Cercospora leaf spot, Anthracnose and Macrophomina bight are important in different parts of the country which reducing the yield of mungbean heavily. Previously web blight was considered as minor disease.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2019; 7(3): 439-440
© 2019 IJCS
Received: 24-03-2019
Accepted: 28-04-2019

Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Neeraj Kumar Rajvanshi
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Popin Kumar
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

RM Tripathi
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

MP Chauhan
Department of Genetics and plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India

Correspondence
Subhash Chandra
Department of Plant Pathology, Narendra Deva University of Agriculture and Technology Kumarganj, Ayodhya, Uttar Pradesh, India

Reaction of urdbean (*Vigna mungo*) genotypes against *Cercospora* leaf spot (CLS)

Subhash Chandra, Neeraj Kumar Rajvanshi, Popin Kumar, RM Tripathi and MP Chauhan

Abstract
The present investigation aimed to identify resistance in urdbean (Vigna mungo) against *Cercospora* leaf spot (CLS) in a field condition. The trial was conducted at Genetics and Plant Breeding Farm of Narendra Dev University of Agriculture and Technology, Kumarganj, Ayodhya. Forty six urdbean genotypes were screened in the summer season of the year of 2015- 2016. The severity of was recorded following 0-9 scale. The urdbean genotypes evaluated were grouped into different categories based on disease reaction. The present results indicated that genotype IPU 11-2, PU 10-23, KU 96-7, Pant U 19, TU 94-2, VBG 09-005, KPU 524-65, NIRB-004, DKU 11, Vamban 7, NDUK 13-6, CO 5, KUG 725, PU 10-16, NUL 7, Pant U 30, WBU 108, NIRB-003, Shekhar 3, NDUK 15-9, TU 67, VBG 12-062, RMG 353, IU 05-1, VBG 11-053, IPM 94-1, RUG 55 and TU 22 were resistant to CLS, 6 genotypes *viz.*; AKU 11-15, K 851, KU 96-3, LBG 645, NIRB-002, COBG 11-03 were exhibited moderately resistant, 05 genotypes *viz.*; LBG 623, MU 46, MU 44, KU 14-1, DBG 11 were showed moderately susceptible, 06 genotypes *viz.*; RUG 59, IPU 2-43, Pant U 31, KUG 479, IPU 13-1, KPU 129-104 were susceptible and only one genotype was highly susceptible. None of these genotypes was found free from infection. The urdbean genotypes which were found resistant the could be the choice for resistance against CLS.

Keywords: urdbean, *Cercospora*, *Vigna mungo*, CLS

Introduction
Pulses represent one of the most important foods that have been extensively used to cover basic protein and energy needs in day today life. Pulses have unique property of maintaining and restoring soil fertility through biological nitrogen fixation as well as covering and improving physical properties of soil by virtue of their deep root system. Urdbean or Blackgram (*Vigna mungo* L.) Hepper is the most important pulse crop of the *'vigna'* group. It is considered to have been domesticated in India from its wild ancestral form (*V. mungo* var. *Silvestris* Lukoki, Marechal & Otoul). Center of genetic diversity is found in India (Zeven and de Wet. 1982) [7]. It is an important crop of India and extensively grown over a wide range of agroclimatic zones of the country.

In India, urdbean occupies 4.50 m ha area, production 2.83 mt and productivity 628 kg/ha (Anonymous, 2018) [1]. Highest productivity of urdbean is reported from West Bengal followed by Andhra Pradesh and Uttar Pradesh. Urdbean is prone to several fungal diseases, among which *Cercospora* leaf spot (CLS) caused by *Cercospora* canescens. Eills and Mortin is one of the most important fungal disease of urdbean causing heavy yield losses particularly in Uttar Pradesh and Uttarakhand states. Disease is also reported from other states *viz.*, Punjab, Haryana, Bihar, Rajasthan, West Bengal, Himachal Pradesh and Jammu & Kashmir (Saksena and Dwivedi, 1973) [6]. Previously *Cercospora* leaf spot was considered as minor disease. Due to change in cropping system and introduction of yellow mosaic resistant varieties it is becoming an important fungal disease and constraint in production of this crop. Resistance is fundamental attributes of all living systems. Host plant resistance (HPR) is the most efficient and ecofriendly means of management. For exploitation of HPR, reliable field and controlled environment screening techniques are essential. Therefore, the present investigation was undertaken with an objective to identify the sources of resistance in different genotypes of urdbean against *Cercospora* leaf spot.

B-4176
[1-6]

RESEARCH ARTICLE Indian Journal of Animal Research, Volume Issue : ()

Histometrical Changes in the Thyroid Gland of Chabro Chicken Reared during Summer and Winter Seasons

Amit Singh Vishen[1], Varsha Gupta, S.P. Singh, Abhinov Verma, Rakesh Kumar Gupta, Hemant Kumar, K.N. Singh, Mukesh Kumar

10.18805/IJAR.B-4176

ABSTRACT

Background: Chabro is a strain of poultry birds especially designed for backyard farming and is more adoptive to climatic variations in the tropics. The thyroid gland plays an important role in controlling basal metabolic rate. The histoarchitectural changes of the gland in association with seasonal changes has not been studied so far in Chabro. The present study describes the season related variations in the histometry of thyroid gland.

Methods: Micrometrical studies were conducted on thyroid gland of eight to ten weeks old 24 apparently healthy Chabro chickens procured from Poultry Farm, DUVASU, Mathura after approval of CPCSEA. For this study the chickens were divided into two groups consist of 12 chickens in each group reared in summer and winter seasons.

Result: Histologically, the thyroid gland was composed of stroma and parenchyma. The capsule had outer thick adipose and inner thin fibrous layers. The follicles were filled with colloid produced by the follicular cells. The percentage of small follicles was more followed by medium and large follicles. The follicles were lined by simple squamous epithelium in summer and cuboidal epithelial cells in winter. All micrometrical parameters, amount of reticular fibers, percentage of large and active follicles were higher in winter.

Key words: Chabro chicken, Histology, Histometry, Season, Thyroid gland.

INTRODUCTION

Backyard poultry farming is being promoted for sustainability of poultry production and upliftment of socio-economic condition of Indian farm-ers. Different central government agencies have developed several strains of poultry birds for backyard farming, Chabro is one of them. Chabro chicken was developed by Central Poultry Development Organization (CPDO) by crossing Barred Plymouth Rock with Red Cornish especially for the farmers of our country owing to more adoptive to climatic fluctuations and acclimatizes to the entire climatic zone. Thyroid is a bilobed structure situated on either side of trachea. It is the only gland in the body of both mammals and birds that stores hormone in its inactive form. The substance of the gland consists of roughly spherical thyroid follicles. The thyroid gland is a unique endocrine gland which plays an important role in controlling pre and post natal growth and differentiation of many organ systems. The work has been conducted in the thyroid gland of different birds in relation to season variation by different scientists. The present study describes the season related variations in the histology and micrometry of thyroid gland in Chabro chicken. This study forms a basis for correlating the possible functions of the thyroid gland in relation to growth and diagnosis of deficiency syndrome.

MATERIALS AND METHODS

The present study was conducted on thyroid gland of eight weeks old 24 apparently healthy Chabro chickens procured from poultry farm of Veterinary College, Mathura in summer and winter seasons in 2018. For histological observations, small pieces of the thyroid gland were collected and fixed in 10% neutral buffered formalin. Fixed tissues were processed by routine paraffin embedding technique (Luna, 1968) and 6µ paraffin sections were procured. Following staining procedures were performed to record histological observations:

1) Haematoxylin and Eosin stain (Luna, 1968) :
   For the study of general histo- architecture of thyroid gland.
2) Masson's trichrome stain (Luna, 1968) :
   For the study of collagen fibers.

Department of Veterinary Anatomy, College of Veterinary and Animal Sciences, U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, (DUVASU), Mathura-281 001, Uttar Pradesh, India.
[1]Department of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya-224 229, Uttar Pradesh, India.

Corresponding Author: Amit Singh Vishen, Department of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya-224 229, Uttar Pradesh, India.
Email: amitvishen56@gmail.com

How to cite this article: Vishen, A.S., Gupta, V., Singh, S.P., Verma, A., Gupta, R.K., Kumar, H., Singh, K.N. and Kumar, M. (2020). Histometrical Changes in the Thyroid Gland of Chabro Chicken Reared during Summer and Winter Seasons. Indian Journal of Animal Research. 10.18805/IJAR.B-4176

Submitted: 13-05-2020 **Accepted:** 01-09-2020 **Online:** 17-12-2020

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 25-27
© 2020 JEZS
Received: 10-01-2020
Accepted: 12-02-2020

Mahesh Kumar Bamniya
Veterinary Officer, Kuchaman city, Nagaur, Rajasthan, India

Rakesh Mathur
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., RAJUVAS, Bikaner, Rajasthan, India

Sanjeev Joshi
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., RAJUVAS, Bikaner, Rajasthan, India

KN Singh
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Amit Vishen
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

S Gharu
Veterinary Officer, Bikaner, Rajasthan, India

Corresponding Author:
KN Singh
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Histological studies on the liver of Marwari Goat (*Capra hircus*)

Mahesh Kumar Bamniya, Rakesh Mathur, Sanjeev Joshi, KN Singh, Mukesh Kumar, Amit Vishen and S Gharu

Abstract
The histological studies were conducted on the liver of 15 Marwari goats. Histologically, the whole liver was invested by peritoneum, except where it was reflected as ligaments and where it adheres to the diaphragm. Underlying it, the liver covered by connective tissue covering called as glisson's capsule. It was composed of collagenous and reticular fibers and few smooth muscles. The reticular fibers formed the stroma. The hepatic lobules were made up of central vein, portal area and one cell thick cords, which were not delineated by connective tissue. The sinusoidals were narrow and somewhat cylindrical. These were lined by continuous endothelial cells resting on basal lamina. Kupffer cells were present attached to the endothelial cells. There were numerous mucous glands present in the mucosa of hepatic, cystic and common bile ducts. The centrilobular and the periportal hepatocyte were rich in the glycogen content.

Keywords: Histology. Marwari goat and Liver

Introduction
Marwari goat (*Capra hircus*) is a domestic animal distributed in the Marwar region of Rajasthan, comprising of Pali, Jodhpur, Jalore, Barmer, Bikaner, Nagaur, and Jaisalmer districts. The goat (*Capra hircus*), is one of the most important animal and the goat husbandry has been playing an important role in the economy of our country with special reference to milk, meat, manure and hide production. The Present study has been planned to justify the functional importance and essentially of the liver, the largest single organ. The resemblance of the structure of liver throughout the animal kingdom, from fishes up to higher vertebrates, encourages the interest to get factual structural details of that colossal gland. Important functions performed by the liver are secretion of bile, excretion of waste product, storage of glycogen and vitamins (Vit. A, D and B), synthesis of fibrinogen, prothrombin, albumin, globulin etc., phagocytosis of foreign particles, detoxification, intermediate metabolism of carbohydrates, proteins and fats and haemopoiesis in embryo. Liver plays an important role in digestion process of these nutrient matter and energy production. An understanding of the structure of liver is vital to the interpretation of these processes.

Materials and Methods
The present study was conducted on 15 apparently healthy adult Marwari Goat (*Capra hircus*) of either sex. The liver from the freshly slaughtered animals were procured from Municipal slaughter house, Bikaner. For the histological examination the small pieces of tissues (2mm size) were collected from 15 livers. From each liver, the tissues were collected from thirteen fixed anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs. Fixed tissue were later washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60 °C, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the following routine and special histological stains to demonstrate different components of liver.

Results and Discussion
The capsule and stroma
In present histological study the liver of Marwari goat was covered by outer peritoneal and the inner connective tissue covering. Similar findings were reported by (Leeson and Leeson, 1981) [6] and (Dellmann and Brown, 1981) [4] in domestic animals, (Pareek, 2000) [10] in sheep and

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDIES ON HISTOMORPHOLOGICAL ORGANIZATIONS OF THE DIFFERENT COMPONENTS OF FEMALE GENITALIA OF BLACK BENGAL GOAT

Mukesh Kumar[1], Sanjay Ray[2], K.N. Singh[3], P.K.Chaudhary[4], Pramod Kumar[5] S.S.Sangar[6] Gaurav Pandey[7]
College of Veterinary Science and Animal Husbandry N.D.U.A.T Faizabad
1. Assistant Professor Dept. of Veterinary Anatomy 2. Professor Dept. of Veterinary Anatomy WBUAFS Kolkata 3.Assistant Professor Dept of Vet. Physiology & Biochemistry 4.. Assistant Professor Dept. of Livestock Product Technology, 5. PhD Scholar Dept. of Livestock Production Management
College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad

Abstract

The present study was conducted in the department of anatomy, histology and embryology, Faculty of Veterinary and animal sciences, West Bengal university of animal fishery science Kolkatta. Total 15 specimens of adult black bengal goat where collected from different slaughter house of kolkatta. After slaughter of animal the samples where collected and brought to the departrmental laboratory for details study. Female genital system comprised of ovaries, fallopian tube, horn of uterus, vagina and vestibules. There were two ovaries and each of them was found to be an oval shape pale in colour organ situated in the corresponding abdominal cavity behind the kidneys and supported by the broad ligament named utero-ovarianligament. The vagina was placed along the middle floor of pelvic cavity. Vagina, vestibule and vulva exhibited usual character of other small domesticated animal. Broad ligament was attached to the lesser curvature of horn. All the above mentioned findings may be utilized by the physiologist, embryo-tranfer technologist, animal breeder and other related workers for the development of the goatery husbandry.

Key words: Histology, female genitalia, Black Bengal goat.

Introduction

Goat is the first domesticated animal for food purpose. Domestication of goat took place about 10,000 year ago in the mountains of west Asia. Goat is small, sturdy and easily adaptable animal and is the species of food animal having widest distribution over the glob the animal husbandry practice is mainly dependent upon the reproductive performances of the species consumed because highly variable structural differences are encountered particularly in the female reproductive systems among the domestic animals. It is therefore become matters of prime importance to study the structural organization of the female genitalia of a particular species.

Goat belong to the family of bovidae, genera Capra and species hircus. Scientific name of goat is Capra hircus. In India, goatery is the best suitable for barren, waste land and hilly areas where partially natural vegetation is available. The poor farmers give priority on goats keeping due to less maintinace cost as compare to cattle and buffalo. Goat is a poor man's cow because of their immense contribution to the poor people's economy.

Since goat meat has no religious bar in all sections of society, also goat meat has less fat which is desirable feather liked by man. Goat meat has ready market due to heavy demand. So the reproduction is outcome of a coordinated series of physiological phenomenon in male and the female goat. For reproduction of animal the details knowledge of gross anatomical disposition and histomorpholical organization on varies components of female genitalia of Black Bengal goat is required. The female reproductive system includes two ovaries, two uterine tubes (fallopian tubes or oviduct), uterus, vagina and vulva the oviduct has three part isthmus, ampulla and infundibulum. The uteres consist of two horns and a body and cervix. The vagina extends from uterus to vulva. Vulva consist of two labia, vestibules, clitoris. The ovum is expelled from the ovary and received by the infundibulum and carried to the uterine tube where fertilization normally occurs. The result of this investigation will certainly be a useful tool to the animal physiologist and breeders for better understanding and functional aspects of all these organs in this animal under normal as well as altered physiological condition.

Materials and Methods

The present study was conducted in the department of anatomy, histology and embryology, Faculty of Veterinary and animal sciences, West Bengal university of animal fishery science Kolkatta.

(A) Collection of specimen

Total 15 specimens of adult black bengal goat where collected from different slaughter house of kolkatta. After slaughter of animal the samples where collected and brought to the departrmental laboratory for details study.

(B) Processing of tissue for histological study

For histological slide preparation different parts of female genitalia of black Bengal goat were collected in small pieces (4-6 mm thick). The small pieces were kept in 10% neutral buffered Formalin. Small tissues of ovary, fallopian tube , uterus and vagina were taken from the sample of specimen. The specimens after fixation for 24 hours were washed under a water for 12 hours. Then tissues were passed ascending grades of alcohol(1hour each) for dehydration. Afterward the tissues were kept in half an hour of absolute alcohol and cedar wood oil for 7 days. Tissues were taken out and kept in small cubicle an xylene for10 minutes for removing of cedar wood oil. The tissues were kept in melting paraffin at the temperature 58° to 60°C. The tissues were changed into three melting paraffin in a paraffin bath for two hour each for three changes. Afterwards blocks were prepared in paraffin by standard procedure. Thin sections (5µ)were cut into with the help of rotary microtome. The sections were deparaffinised in Xylene and stained with haematoxylin an eosin as per routine method. Harris Haematoxylin (1900) was used in the staining procedure. Photomicrographs were made under light microscope in various magnifications of the luminal surface of horn, stereoscopic microscope was used.

The different parts of genitalia were measured, data were recorded and analyzed by standard statistical method.

Results and Discussion

Histomorphological organisation of various tissues of all the different components of female genitalia of Black Bengal goat have been studied in this investigation. The result have been presented under the following headings.

Ovary:

The ovaries represented the two distinct zone, outer cortex and inner medulla. The ovary was covered by the germinal epithelium. Ovarian follicles in various stages of development were found in the cortical zone, could be seen some large follicles with or without ovum.

Mature graffian follicle clearly identified in the histological slide. The blood vessels, nerves and lymphatics were found. These findings are in agreement with the Bacha et al(2000), Banks et al (1981), Dallmann et al (1998), Banerjee (1998), Frandson et al (1992) who have stated that ovary had outer cortex and inner medulla. In the cortical portion ovary contained more number of ovarian follicles. In the medullary portion there was loose connective tissue, nerve fibres and lymphatics.

Fallopian Tube:

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1418-1421

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1418-1421
Journal homepage: http://www.ijcmas.com

Original Research Article

Gross and Morphometrical Studies on the Kidney of Marwari Sheep (*Ovis aries*)

Krishna Nand Singh[1*], Sanjeev Joshi [2], Rakesh Mathur[2], Mukesh Kumar[1] and Anandita Srivastava[2]

[1]Department of Veterinary Anatomy and Histology ,C.V.Sc &A.H.,N.D.U.A & T., Kumarganj- Faizabad (U.P.), India
[2]Department of Veterinary Anatomy and Histology, CVAS, Bikaner, India
**Corresponding author*

Keywords

Marwari sheep, Kidney, physical parameters, body weight

ABSTRACT

A study conducted on the kidneys of *Marwari* sheep of either sex between the ages of 1-2 years. The morphological studies was done on the kidneys of 24 sheep and revealed that right kidney was slightly longer than the left and there was no significant difference observed between the weight, width, thickness, circumference and volume of right and left kidneys. Both the kidneys were bean shaped smooth and reddish brown in color. The renal crest or common papilla formed by the fusion of six to twelve pyramids.

Introduction

~~Ashwagandha [*Withania somnifera* (L.) Dunal] is an important medicinal plant of India belonging to Solanaceae. A native of Mediterranean region in North Africa, it is also found in Madhya Pradesh, Punjab, Himachal Pradesh, Western Uttar Pradesh and Himalayas.~~

~~It is cultivated in an area of about 4000 ha in India (Farooqui and Sreeramu, 2001). In Madhya Pradesh, it is cultivated in Neemuch, Chhindwara, Mandsaur, Seoni, Katni, Shahdol, Dewas, Dindori, Hoshangabad and Jabalpur districts. Roots are excellent for preparing medicines. Diseased leaves exhibited decrease in sugars (20%) and chlorophyll (26.5%) whereas; increase was noticed for proline (25%), free amino acids (3%) and proteins (74.3%).~~

~~The leaf blight of Ashwagandha caused by *A. alternata* revealed that a little information is available more particularly on disease prediction module in Madhya Pradesh leading to its management. Therefore, an attempt was being made for its management through fungicides, organic manure and biofertilzers.~~

Materials and Methods

The present study was conducted on 17 to 22 kg body weight bearing fifty apparently healthy adult Marwari sheep (*Ovis aries*) of either sex, 7-12 months old age. The livers were procured from the freshly slaughtered animals at Municipal slaughter house, Bikaner. The measurment for various physical parameters like weight, length,

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 31-33
© 2020 JEZS
Received: 12-01-2020
Accepted: 15-02-2020

Mukesh Kumar
Department of Veterinary Anatomy, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Sanjay Ray
Department of Veterinary Anatomy, WBUAFS, Kolkata, India

KN Singh
Department of Veterinary Anatomy, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Amit Singh Vishen
Department of Veterinary Anatomy, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

PK Choudhary
Department of Veterinary Physiology and Biochemistry, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Rakesh Kumar Gupta
Department of Veterinary Pathology, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Mukesh Kumar
Department of Veterinary Anatomy, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Histological studies on the ovary and uterus of Black Bengal Goat

Mukesh Kumar, Sanjay Ray, KN Singh, Amit Singh Vishen, PK Choudhary and Rakesh Kumar Gupta

Abstract
The present study was conducted in the department of anatomy, histology and embryology, faculty of veterinary and animal sciences, west Bengal University of animal fishery science, Kolkata. Total 15 specimens of adult black Bengal goat were collected from different slaughter house of Kolkata. After slaughter of animals the samples were collected and brought to the departmental laboratory for histological study. Female genitalia comprised of ovaries, fallopian tube, horn of the uterus, vagina and vestibules. There were two ovaries and each of them was found to be oval shaped and pale in colour situated in the corresponding abdominal cavity behind the kidneys and supported by the broad ligament named utero- ovarian ligament. Broad ligament was attached to the lesser curvature of the horn. All the above mentioned findings may be utilized by the physiologist, embryo-transfer technologist, animal breeder and other related workers for the development of the goatery husbandry.

Keywords: Histology, Black Bengal goat, Ovary and Uterus

Introduction
Goat is the first domesticated animal for food purpose. Domestication of goat took place about 10,000 years ago in the mountains of west Asia. Goat is small, sturdy and easily adaptable animal and is the species of food animal having widest distribution over the globe. The animal husbandry practice is mainly dependent upon the reproductive performances of the species consumed because highly variable structural differences are encountered particularly in the female reproductive systems among the domestic animals. It is therefore become matters of prime importance to study the structural organization of the female genitalia of a particular species.

Goat meat has no religious bar in all sections of society, also goat meat has less fat which is desirable feather liked by man. Goat meat has ready market due to heavy demand. So the reproduction is outcome of a coordinated series of physiological phenomenon in male and the female goat. For reproduction of animal the detailed knowledge of gross anatomical disposition on varies components of female genitalia of Black Bengal goat is required. The female reproductive system includes two ovaries, two uterine tubes (fallopian tubes or oviduct), uterus, vagina and vulva. The oviduct has three parts as isthmus, ampulla and infundibulum. The uterus consists of two horns, a body and cervix. The vagina extends from uterus to vulva. Vulva consists of two labia, vestibules, clitoris. The ovum is expelled from the ovary and received by the infundibulum and carried to the uterine tube where fertilization normally occurs. The result of this investigation will certainly be a useful tool to the animal physiologist and breeders for better understanding and functional aspects of all these organs in this animal under normal as well as altered physiological condition.

Materials and method
The present study was conducted in the department of Anatomy, Histology and Embryology, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal Fishery Science Kolkata.

(A) Collection of specimen
Total 15 specimens of adult Black Bengal goat were collected from different slaughter house of Kolkata. After slaughter of animal, the samples were collected and brought to the departmental laboratory for detailed study.

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

GROSS AND HISTOLOGICAL STUDIES OF THE URETER IN *MARWARI* SHEEP (*Ovis aries*)

Krishna Nand Singh[1], Sanjeev Joshi [2], Rakesh Mathur[2], Mukesh Kumar[1], Pramod Kumar[1], S.S. Sengar[1] K. K. Tripathi[1] and Rakesh Gupta[3]

1. Asstt. Professor, C. V. Sc & A.H., N.D.U.A & T., Kumarganj- Faizabad (U.P.)
2. Department of Veterinary Anatomy and Histology, CVAS, Bikaner
3. P.G. scholar Department of Veterinary Pathology C. V. Sc & A.H., N.D.U.A & T.

Abstract

The present study was conducted on ureters of 15 *Marwari* sheep of either sex between the ages of 1.5 -2 years. It was a long and thin muscular tube begins from renal pelvis at the hilus and passes backward along medial border of kidney. In the Histological structure ureter was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance. Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles. The outer layer tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings.

Key words: Ureter, Stellate Lumen, transitional epithelium, smooth muscle fiber.

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. The present investigation has been planned to study the gross and histological structure of the ureter to justify its importance and essentiality in the body. In mammals the ureters are the chief excretory ducts of the body.

Materials and Methods

The Gross study was conducted on 15 apparently healthy adult *Marwari* Sheep (*Ovis aries*) of either sex. The Ureters from the freshly slaughtered animals were procured from Municipal slaughterhouse, Bikaner.

For the histological examination the small pieces of tissues (2 mm size) were collected from 12 ureters (6 right and 6 left). From each, the tissues were collected from different anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs, Bouin's fluid for 12 hrs, and Zenker's fluid for 18 hrs (Singh, U.B. and Sulochana, S. 1996). Fixed tissue was latter washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60°C, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the histological stains (Luna, L.G. 1968). to demonstrate different histological structures of ureters.

Results and Discussion

Each kidney was connected to the urinary bladder by a ureter. It was a long and thin muscular tube begins from the renal pelvis at the hilus and passes backward along medial border ofthe kidney. It passes further caudally and enters in tothe pelvic cavity. It inclines inward and downward and open in to the bladder at the caudodorsal aspect. Similar findings were also reported by Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals.

In the histological structure the ureter of Marwari sheep was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance (Dellmann HD, 1993). Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres which was dense towards the epithelium and loose towards the muscularis mucosa. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles (Fig1. and Fig 2.). The outer layer, the tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings. Similar findings were also reported by Doaa Zaghloul *et al* in Camel, Woldemeskel *et al* (1998) in sows and Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals. Whereas A.R. Sreeranjini *et al* (2010) found that the sub mucosa of intra renal ureteric branches and ureter in Japanese quail contains collagen, elastic and reticular fibers. Tunica muscularis of ureter contained few elastic fibers among smooth muscle fibers. Tunica adventitia was comprised of loose connective tissue containing collagen and elastic fibers.

References

1. **A.R. Sreeranjini, M. P. Iyyangar and D. Pramod kum (2010).** HISTOLOGICAL STUDY ON THE FIBRO ARCHITECTURE OF KIDNEY AND URETER JAPANESE QUAIL (COTURNIX COTURNIX JAPONICA Tamilnadu J. Veterinary & Animal Sciences 6 (2) 107-1 March - April 2010.
2. **Dyce, K. M.; Sack, W. O. and Wensing C. J. G. (20** Textbook of veterinary anatomy 4th ed[n]. Saunders Co Philadelphia. pp: 181
3. **Dellmann HD**. Text book of veterinary histology. 4th Edn. and Febriger, Philadelphia, USA, 1993, 194-212.
4. **Doaa Zaghloul, Shireen Hafez and Thomas Caceci (2** Microscopic anatomy and ultrastructure of the Cam dromedarius ureter Eur. J. Anat. 17 (4) 202-208 (2013)
5. **Konig, H. E. and Liebich, H. G. (2006).** Veterinary anatom domestic animals, 3rd ed[n], Schattauer, Stuttgart, Germany, 375-376.
6. **Luna, L.G. (1968).** Manual of histological staining metho the Armed Forces Institute of Pathology. 3rd ed. Mc Graw Book Company, New York.
7. **Singh, U.B. and Sulochana,** S. (1996). Handboo Histological and Histochemical Techniques. 2nd ed. 5 -1 Kothi, Hyderabad, Andhra Pradesh, India. Premier Publi House.
8. **Woldemeskel M., Drommer W. and Wendt M.** Histology and ultrastructure of the urothelium lining the and the renal pelvis in sows Anatomia, histologia, Embry 27 (1), 51-55, 1998.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 1422-1424

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Special Issue-7 pp. 1422-1424
Journal homepage: http://www.ijcmas.com

Original Research Article

Gross and Histological Studies of the Renal Arteries in Marwari Sheep (*Ovis aries*)

Krishna Nand Singh[1], Sanjeev Joshi[2], Rakesh Mathur[2], Mukesh Kumar[1] and Mahesh Kumar Bamniya

[1]Department of Veterinary Anatomy and Histology, C.V.Sc &A.H., N.D.U.A & T., Kumarganj-Faizabad (U.P.), India
[2]Department of Veterinary Anatomy and Histology, CVAS, Bikaner
[3]Veterinary officer, Rajasthan Government, India
**Corresponding author*

Keywords

Marwari sheep, Renal arteries, Arcuate artery, Longitudinal smooth muscle fiber

A B S T R A C T

A study conducted on the renal arteries of 12 *Marwari* sheep of either sex between the ages of 1.5 -2 years. Each renal arteries emanated laterally from the abdominal aorta at the level of the third lumbar vertebra. Each of them were divided into the lobar branches before reaching the hilus. Which gave 4-8 interlobar branches which ended into arcuate and interlobular arteries. The sub endothelial layer of renal artery was irregularly oriented. The inner elastic membrane showed corrugations. The middle layer consisted thick layer of smooth muscle cells. The outer layer consisted of irregular elastic and collagen fibres along with longitudinally arranged bundles of smooth muscle fibres.

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions.

The present investigation has been planned to study the gross and histological structure of the kidney to justify its importance and essentiality in the body. In mammals the kidneys are the chief excretory organs of the body. They have a major role in the maintenance of fluid and electrolyte balance and in control of the blood pressure. The kidneys also produce and release a humoral agent (erythropoietin) in to the blood stream which affects the blood formation. This suggests that the organ has an extraordinary complex structure.

Materials and Methods

The study was conducted on the renal arteries of 12 *Marwari* sheep of either sex between the ages of 1.5 -2 years. The kidney with renal arteries from the freshly slaughtered animals were procured from

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; SP-8(2): 28-30
© 2020 JEZS
Received: 12-01-2020
Accepted: 14-02-2020

Mukesh Kumar
Department of Veterinary Anatomy, C.V. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Sanjay Ray
Department of Veterinary Anatomy, WBUAFS, Kolkata, India

KN Singh
Department of Veterinary Anatomy, C.V. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Amit Singh Vishen
Department of Veterinary Anatomy, C.V. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

PK Choudhary
Department of Veterinary Physiology and Biochemistry, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Rakesh Kumar Gupta
Department of Veterinary Pathology, C.V.Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Corresponding Author
Mukesh Kumar
Department of Veterinary Anatomy, C.V. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Gross anatomical studies on the ovary and uterus of Black Bengal Goat

Mukesh Kumar, Sanjay Ray, KN Singh, Amit Singh Vishen, PK Choudhary and Rakesh Kumar Gupta

Abstract
The present study was conducted in the department of anatomy, histology and embryology, faculty of veterinary and animal sciences, West Bengal University of animal fishery science, Kolkata. Total 15 specimens of adult black Bengal goat were collected from different slaughter house of Kolkata. After slaughter of animals the samples were collected and brought to the departmental laboratory for detailed study. Female genitalia comprised of ovaries, fallopian tube, horn of the uterus, vagina and vestibules. There were two ovaries and each of them was found to be oval shaped and pale in colour situated in the corresponding abdominal cavity behind the kidneys and supported by the broad ligament named utero-ovarian ligament. Broad ligament was attached to the lesser curvature of the horn. All the above mentioned findings may be utilized by the physiologist, embryo-transfer technologist, animal breeder and other related workers for the development of the goatery husbandry.

Keywords: Black Bengal goat, Ovary and Uterus

Introduction
Goat is the first domesticated animal for food purpose. Domestication of goat took place about 10,000 years ago in the mountains of west Asia. Goat is small, sturdy and easily adaptable animal and is the species of food animal having widest distribution over the globe. The animal husbandry practice is mainly dependent upon the reproductive performances of the species consumed because highly variable structural differences are encountered particularly in the female reproductive systems among the domestic animals. It is therefore become matters of prime importance to study the structural organization of the female genitalia of a particular species.

Goat meat has no religious bar in all sections of society, also goat meat has less fat which is desirable feather liked by man. Goat meat has ready market due to heavy demand. So the reproduction is outcome of a coordinated series of physiological phenomenon in male and the female goat. For reproduction of animal the detailed knowledge of gross anatomical disposition on varies components of female genitalia of Black Bengal goat is required. The female reproductive system includes two ovaries, two uterine tubes (fallopian tubes or oviduct), uterus, vagina and vulva. The oviduct has three parts as isthmus, ampulla and infundibulum. The uterus consists of two horns, a body and cervix. The vagina extends from uterus to vulva. Vulva consists of two labia, vestibules and clitoris. The ovum is expelled from the ovary and received by the infundibulum and carried to the uterine tube where fertilization normally occurs. The result of this investigation will certainly be a useful tool to the animal physiologist and breeders for better understanding and functional aspects of all these organs in this animal under normal as well as altered physiological condition.

Materials and method
The present study was conducted in the department of anatomy, histology and embryology, Faculty of Veterinary and animal sciences, West Bengal University of animal fishery science, Kolkata. Total 15 specimens of adult Black Bengal goat where collected from different slaughter house of Kolkata. After slaughter of animal the samples were collected and brought to the departmental laboratory for detailed study. Immediately after collection, gross anatomical observations were done by dissecting microscope and naked eye. The length, the width, thickness of ovary and uterus was measured by electronic slide caliper. The weight of ovaries were taken by weighing balance and the reproductive tract was incised and internal

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 997-998

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

2278-4136
2349-8234
2018; SP1: 997-998

ana Nand Singh
t. Professor, Department of
erinary Anatomy and
stology, C. V. Sc & A.H.,
D.U.A & T., Kumarganj-
Faizabad, U.P, India

Sanjeev Joshi
Department of Veterinary Anatomy and Histology, CVAS, Bikaner, Rajasthan, India

Rakesh Mathur
Department of Veterinary Anatomy and Histology, CVAS, Bikaner, Rajasthan, India

Mukesh Kumar
Asstt. Professor, Department of Veterinary Anatomy and Histology, C. V. Sc & A.H., N. D.U.A & T., Kumarganj-Faizabad, U.P, India

Pramod Kumar
Asstt. Professor, Department of L.P.T, C. V. Sc. & A.H., N. D.U.A & T., Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Krishna Nand Singh
Asstt. Professor, Department of Veterinary Anatomy and Histology, C. V. Sc & A.H., N. D.U.A & T., Kumarganj-Faizabad, U.P, India

Micrometry of renal corpuscles and renal tubules in *Marwari* Sheep (*Ovis aries*)

Krishna Nand Singh, Sanjeev Joshi, Rakesh Mathur, Mukesh Kumar and Pramod Kumar

Abstract
The microscopic studies of Renal tubules of 6 *Marwari* sheep showed that there was no significant difference between juxtamedullary renal corpuscles and cortical corpuscles. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns. The average diameter of PCT, DCT, collecting duct, thick and thin segment of loop of Henle was 49.91±2.02, 39.14±1.82, 42.80±0.99, 32.85±1.11, and 19.50±0.76 micron respectively.

Keywords: *Marwari* sheep, Micrometry, Renal corpuscles, loop of Henle

Introduction
Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. In mammals the kidneys are compound tubular glands and the chief excretory organs of the body. They have a major role in the maintenance of fluid and electrolyte balance and in control of the blood pressure.

Materials and Methods
The diameter of various parts of uriniferous tubule was measured from random samples seen under light microscope in high power (400X). The Micrometry of Renal tubules across various areas were recorded by using occular micrometer after calculating calibration with stage micrometer to record the observations on mean diameters of various parts of nephron and collecting duct.

Results and discussion
The Renal Corpuscles
Renal corpuscles in the cortical region (Fig.1) had an average transverse diameter of 134.79±5.47 microns and average vertical diameter was 98.99±3.83 microns. The average transverse diameter of juxtamedullary renal corpuscles was 158.63±2.94 microns and average vertical diameter 109.42±3.44 microns. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns (Table 1).

The Proximal Convoluted Tubule
The diameter of the proximal convoluted tubule varied from 39.4 to 67.9 microns, with an average of 49.91±2.02 microns (Table 2). It was similar to the findings of Trautmann and Fiebiger (1957) [4] who stated that the diameter of proximal convoluted tubule ranged from 40 to 60 microns in domestic animals. Yadava and Calhoun (1958) [5] recorded an average diameter of proximal convoluted tubule to be 56, 50, 45 and 45 microns for horse, ox, sheep and goat respectively. Whereas Ommer and Mariappa (1970) [3] reported in Indian buffalo the an average diameter was 47.4 microns with a range of 40.7 to 64.7 microns and Beniwal (1995) [1] reported in camel that an average diameter was 76.63 microns with a range of 43.9 to 117.28 micron.

Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 6 Special issue [4] 2017: 298-301
©2017 Academy for Environment and Life Sciences, India
Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95
FULL LENGTH ARTICLE OPEN ACCESS

Effect of Stocking Density on The Growth of Commercial Broiler Chicks Raised in Winter Season In Jharkhand

Mukesh Kumar[1], Gaurav Panday[2], Naveen Kumar Singh[3], K.N. Singh[1], P.K. Choudhary[4] S.S.Sanger[5]
1. Assistant Professor Dept. of Veterinary Anatomy,
2. PhD Scholar Dept. of Livestock Production Management,
3. Assistant Professor Veterinary Clinical Medicine,
4. Assistant Professor Dept. of Veterinary Physiology and Biochemistry
5. Assistant Professor Dept. of Livestock Product Technology
College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad.
E-mail: drmukesh1981@yahoo.com

ABSTRACT

The experiment was conducted on stocking density of commercial broiler chicks reared in winter season under the existing climatic condition of Jharkhand. A total of 640-day-old chicks were housed at stocking densities of 0.50 sq.ft/bird, 0.75 sq.ft/bird, 1.0 sq.ft/bird and 1.25 sq.ft/bird. The result show the heaviest body weight of day-old-chicks was found to be 43.20 g in winter season. At 6th week of age the final body weight was 2589.50 g in winter season. The highest body weight was recorded as 2410.0 g on stocking density 1.0 sq.ft/bird. Stocking densities were found to be significant in the age group of 2nd and 6th weeks. Male birds were heavier (2524.42 g) than female birds (2122.40 g) at the end of sixth week. The average weekly feed consumption at 6th week of age in the birds was 1102.50 g in winter season. Seasonal effect was found to be significant up to 4th week of age. Feed consumption was recorded 1005.25 g, 912.38 g, 1006.50 g and 1006.50 g in the birds reared at the floor spaces of 0.50 sq.ft/bird, 0.75 sq.ft/bird, 1.0 sq.ft/bird and 1.25 sq.ft/bird, respectively. Significant effect (P<0.01) of winter of season on body weight gain was observed during 4th and 5th week of age. Body weight gain was recorded maximum at stocking density of 1.0 sq.ft/bird i.e. 654.25 g. Average feed conversion ratio was 1.69 (0.5 sq.ft/bird),1.52 (0.75 sq.ft/bird),1.53 (1.0 sq.ft/bird) and 1.57 (1.25 sq.ft/bird) at 6th week of age. It was apparent from the study that floor space allotted to chick during the early period was influential on rate of growth.

Key words: *Growth, density, season, feed conversion ratio*

Received 01.10.2017 Revised 21.10.2017 Accepted 29.10.2017

INTRODUCTION

In broiler production, floor space per chicken or stocking density is very important welfare factor which directly and indirectly influences and determines the level of growth of chicken. Growth in broilers is directly governed by amount of feed consumed and floor space per bird (1). Poultry producers tend to increase at the number of birds per unit of space to reduce housing, equipment and labour cost per unit of space and thereby to produce more kg of broiler per area. However, income per bird often decreases primarily due to reduction of growth rate, increased proportion of down graded carcass and greater risk of health related problems. Therefore, profitability increases with stocking density up to critical point. Although it is nearly impossible to prevent or eliminate all consequences of stocking density, a better understanding of what accurs as we increases the number of birds per unit area of floor space, however, will help to increase our awareness of potential problems and giving us the opportunity to take appropriate preventive measures. Therefore, the following study highlights necessity of space in order to express genetic potential and make the best use of feed by the broiler birds.

MATERIALS AND METHODS

Day-old-chicks of commercial strain (ven cob 400) were reared in winter season under standard management condition for 6 weeks on deep litter system under existing agro-climate condition of

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 332-335

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 332-335
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on the Sensory and Microbiological Parameters of the Pork Sandwich Spread in View with its Stability at Frozen Storage

S. S. Sengar[1*], R. C. Keshri[2], Mukesh Kumar[3] and K. N. Singh[3]

[1]Department of L.P.T., C.V. Sc. & A. H., N. D.U.A.T. – Kumarganj, Faizabad (U.P.), India
[2]Division of L.P.T., I.V.R.I. - Bareilly (U.P.), India
[3]Department of VAN, C.V.Sc. & A.H., N. D.U.A.T. – Kumarganj, Faizabad (U.P.), India
**Corresponding author*

A B S T R A C T

Pork sandwich spread incorporated with different ingredients like honey, vitamin –C and nisin was stored and studied for the attainment of its maximum shelf life at the frozen storage. A highly significant ($P \leq 0.01$) difference for the appearance, flavor, juiciness, texture, spread ability, adhesion ability and overall acceptability. Although, the score was in decreasing trend on 45th day, even though the scale of score was rated between 'good' to 'very good' by the panelists. The remarkable acceptability for the pork sandwich spread was given by the panelists even on 45th day of storage. Total Plate Count (TPC) and Psychrophilic count on 45th day of storage were found to be 2.85 log cfu/g and 2.13 log cfu/g respectively. The Coliform, Yeast and Mould were not detected throughout the experimental period in the treated sample and it was found safe for consumption.

Keywords

Spread, shelf life, TPC, Psychrophilic, log cfu/ g

Introduction

Meat as a food item is well accepted globally and do vary in its form for consumption. Meat has been identified, often wrongly, as a food having a high fat content and an undesirable balance of fatty acids. Meat consumption in India particularly varies according to its state, religion, consumption pattern and above all the taste. In fact lean meat is very low in fat (20-50 g/kg), pork and poultry have a favorable balance between polyunsaturated and saturated fatty acids (P:S) and grazing ruminants produce muscle with a desirable n-6:n-3 polyunsaturated fatty acid ratio. Storage of meat often leads to the development of abnormal odors and tastes and loss of colour. Chemical composition and biological characteristics make meat an excellent environment for microbial growth. Many factors influence the growth rate and activity of the microorganisms, including temperature, atmosphere, pH, salt concentration and product composition. The spoilage rate was related to initial pH, fat content etc. regardless of the origin of the meat (Blixit and Borch, 2002). Meat spread is a convenience product and constitutes meat, fat and other ingredients. Many such parallel products are available in the market but are not the meat based. Hence in the present study the product was incorporated with certain ingredients (honey, vitamin-C and nisin) having functional properties to improve the product quality and storage

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue XI Nov 2020- Available at www.ijraset.com

Effect of Organic, Inorganic Fertilizers on Maize Emergence, Growth and Performance

S. Sasank[1], Parameswar Jena[2], Dipti Bisarya[3], Vinai Kumar[4], A. K. Singh[5]
[1]B. Sc. Student, School of Agriculture, Lovely Professional University, Phagwara Punjab.
[2]M. Sc. Student, Department of Agronomy, School of Agriculture, Lovely Professional University, Phagwara Punjab.
[3]Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, (Punjab) *Corresponding author
[4]Assistant Professor, Teerthanker Mahaveer University, Moradabad (UP) and
[5]Department of Agril Economics, College of Agriculture, Campus Azamgarh, NDUAT, Ajodhya, (U.P.)

Abstract: *Zea mays the third most important cereal crop in India but the Performance of maize is effected by the depth of sowing. A Pot experiment is conducted in Addanki, Prakasam (Dist) Andhra Pradesh with 3 different treatments Organic Inorganic and Absolute control. From overall results we observed that Organic treatment is better than other treatments because it shows better performance in all parameters like germination%, plant height, no of leaves etc and even it was observed that the tassels they emerged first in organic treatment only.*

Keywords : Maize, organic, chemical fertilizers and sustainability

I. INTRODUCTION

Maize (*Zea mays*) is a cereal grain belongs to Poaceae family crop also known as queen of cereal due to diverse uses. In India it is cultivated in most of the states throughout all the season. India ranks 3rd in maize after Rice and Wheat crop, It is staple human food, feed for livestock, for fermentation and many industrial uses. It is having abundant starch (65%). There are two types of milling. Wet milling produces industrial starch like sweeteners, also produces various modified maize starch for paper lamination, textile wrap, sizing and laundry finishing. Dry milled products are animal feed, brewing, breakfast cereals, other food. In India, dry milling is the predominant process for flour and animal feed, fermentation and distilling industries and composite flours. In the new millennium, it is an alternate crop to rice and wheat. About 35% production is consumed by human, 25% poultry and cattle 15% food processing calorically (higher perceived sweetness) other than sugarcane or sugar beet.

The major maize growing states are Karnataka, Maharashtra, Madhya Pradesh, Tamilnadu, Telangana, Bihar and Andhra Pradesh. Karnataka is the largest producer with 1.29million hectares area under cultivation and 3.55 million tons production followed by Maharashtra with 1.16million hectares area under cultivation and 3.54 million tons of production. (Directorate of Economics and statistics, DAC&FW) .Maize is grown in different types of climates but performs well in hot regions with annual rainfall of 60cm. It can grow in all types of soils but loamy sandy to clay loamy soils with abundant organic matter are preferred. The pH of 6.5-7.5 is preferred. In India maize is mostly used for poultry (47%) followed by direct consumption (20%). The average yield of maize is about 3 tonnes per hectare which is far less than that of 5 tonnes per hectare in countries like USA, China.

The average yield of maize in India is less due to many biotic and abiotic factors like weeds, pests, climate and soil conditions out of which proper sowing depth is one and most important for proper germination and yield. Therefore proper depth of sowing is to be determined and maintained to maximize the growth and yield.

II. MATERIALS AND METHODOLOGY

Experiment location -The pot experiment conducted in the kharif season of year 2020 (during the time of covid-19) at Addanki location to find the result under different climatic conditions. The location of the experiment are:-Addanki, Prakasam(dist) the latitude of Addanki is 15.8107° N, longitude is 79.9724° E Soil : the soils in Addanki (A.P) vary from black to sandy loam soils. Annual rainfall of 906mm and the average temperature is 28.5°c and semi arid region. Before sowing the seeds we have given Basal dosages of urea, NPK and FYM (farm yard manure). while top dressing we have given same Basal dosages of urea, NPK and FYM (farm yard manure) to the soils for better growth. The irrigation is given for every two days and Data were collected on 10 ,20,30,40,50 days after sowing .Growth parameters like Plant height, No. of Leaves, Leaf length, Leaf width were collected.

©IJRASET: All Rights are Reserved

Plant Archives Volume 20 No. 2, 2020 pp. 8463-8464 e-ISSN:2581-6063 (online), ISSN:0972-5210

STUDY OF THE ECONOMICS AND BENEFIT COST RATIO OF BRINJAL AT DIFFERENT FARM LEVELS

Ajit Verma[1], Sarita Srivastava[2], Vinay Kumar Singh[3], Ashok Kumar Singh[4] and Anil Kumar Singh[5]

[1]Department of Farm Management, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Home Science, KrishiGyan Kendra, Deoria (U.P.), India.
[3]Department of Horticulture, KrishiGyan Kendra, Baribag, Ghazipur (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.

Abstract

The main objective of the present study was to analysis the economics and benefit cost ratio of Brinjal in two villages of Ghazipur district of Uttar Pradesh, India. It was found that the farmers of all selected randomly groups has been taken the crop on their field through a good advance package of practices, therefore their yield and net return in all size groups increased respectively in time. The study concludes yield and net return should be increased in future if they go through a good farm plans along with better crop management systems.

Key Words: Village, Farmers, Yield, Income, Farm plans.

Introduction

Brinjal (*Solanum melongena* L.) is warm season crop its plant not with stand frost the main sowing season being during July-August for a good yield 20-25 tons of FYM per hectare incorporated into the soil at the time of field preparation. It is necessary to maintain an even moisture supply in the soil; over watering is as harmful as insufficient irrigation. In this crop, phomopsis wilt is the most important fungal disease and is seed borne. Hot water treatment of the Seed helps to reduce the incidence of the disease. Little leaf is caused by mycoplasma and can be partially controlled with antibiotics. Brinjal is prone to attack by many damages caused by insects, pests, fungus, bacteria and viruses Purohit ML and Khatri AK (1973). Brinjal productions area consistently and extensively damaged by brinjal fruit and shoot borer and other fruit borer insects reported by Kuppu Swamy and Balasubramanian (1980). To reduce pest linked damage in brinjal as well as to protect the environment from adverse effect of pesticides, as an insect resistance management strategy Ghosh *et al.*, (2003). In India brinjal is the major source of profitable income for farmers because of local demand and it is a perennial crop so that fruit can be harvested throughout the year. A large number of brinjal varieties and hybrids are grown by small, medium, large size of farmers throughout the year.

Materials and Methods

The present study was conducted in two randomly selected villages namely Jaitpur (Block-Sador) and secondly Gaura (Block-Sadat) in Ghazipur district of Uttar Pradesh, India with farmers Scientist Collaborations in demonstrated groups small, medium and large size while selected randomly seven farmers from each groups Narendra hybrid Baigan-1 has been suggested seed rate 500-600 gram per hectare during field preparations 25 tons of FYM allowed to the soil planting distance line to line 60-75 cm and plant to plant are 45-60 cm. was proposed. Crop was taken on the field during July-August Season N:P:K:@ 100:50:25 Kg/hectare for better quality and better yield advised. All the advance package of practices has been specify for timely whenever needed. Survey method has been used to collect the data and tabular analysis was being used. Family schedule has been used to collect the data from the selected farmers according to their size of holdings, family size, area of the productionand income of the crop etc.The economic has been calculated at their current price rates.

...ohiya Volume 20 No. 2, 2020 pp. 1995-1996 e-ISSN: 2581-6063 (online), ISSN: 0972-5210

...DY OF THE ECONOMICS OF CHILLI (*CAPSICUM ANNUUM*) ON ...ERENT FARM CONDITIONS

...rma[1], Vinay Kumar Singh[2], Anil Kumar Singh[3], Ashok Kumar Singh[4] and Sarita Srivastava[5]

[1]Department of Farm Management, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[2]Department of Horticulture, Krishi Gyan Kendra, Baribag, Ghazipur (U.P.), India.
[3]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[4]Department of Agricultural Economics, College of Agriculture, Kotwa, Azamgarh (U.P.), India.
[5]Department of Home Science, Krishi Gyan Kendra, Deoria (U.P.), India.

Abstract

...n objective of the present study was to study the Economics of Chilli in the randomly selected farmers of villages in ...r district of Uttar Pradesh, India. It was found that farmers has adopted all the advance package of practices and ...time to time during the cropping time resulted good yield and high net incomes. In future it will also be improved ...er they use better crop management practices with high profile business thinking.

...nds: Village, Yield, Farmers, Specific, Trends, Exhibits.

Introduction

...i also called "red paper" is an important cash ...ndia and is grown for its pungent fruits, which ...both green and ripe (the letter in the dried form) ...r pungency to the food. As a condiment, it has ...indispensable in every Indian home. It is also ...dicinally, and in chantries and pickles. Capsicum ...are herbaceous or semi woody annuals or ...s very high rainfall during its growth is harmful. ...rigation and good manuring, excellent crops can ...in sandy and light alluvial loams as well as in red ...ils. As a garden crop, it is sometimes allowed to ...a stand-over crop for one or two seasons. The ...loughed and harrowed 3 or 4 times to obtain a ... Recommended dose of FYM is better for good ...d better qualities. The Chilli is generally ...ted, through direct sowing. Foliar spray of Zinc ...not increase the yield and quality of the crop ...d Vadivela (1967). The combined spray of Zinc, ...d iron through soil or its foliar Spray is better for ...eiding; Suryandrayra and Hariprasad (1985) ...that these micronutrients increased the green ...Chillies. Hosmani and Hosmani (1993) give details ...illies inther second edition. Seeds taken from ...well matured fruits selected for the purpose are mixed with ashes and shown evenly in well-manured nursery beads. The nursery treatment and other recommended practices had been taken at the time of their requirements.

Materials and Methods

The present study was conducted on the field in Ghazipur district of Uttar Pradesh, India in randomly selected two villages namely Bishunpura (Block-Karanda) and Secondly Gajpatpur (Block-Berno) through farmers-scientist collaborations ranging small, medium and large size farmers groups. Seven farmers from each groups has been selected randomly. Pusa Sadabahar Chilli Variety has been offered for the demonstrations. Allowed 1 Kg. seed for a hectare to maintain line to line distance about 50 Cm and plant to plant distance 45 Cm. The crop has been taken on the field on the field during August-September. All the package of practices has been introduced to the farmers for their better yield and qualities regarding time to time applications. All the information has been collected through survey method and tabular analysis was being used. Family schedule has been used to collect the data regarding family size, area of the crop, expenditure and net income. Emphasis has been given on cultural operation irrigation and other recommended practices for the upliftment of the crop.

International Journal of Chemical Studies

P-ISSN: 2349-8528
E-ISSN: 2321-4902
www.chemijournal.com
IJCS 2020; 8(6): 2308-2313
© 2020 IJCS
Received: 28-10-2020
Accepted: 09-11-2020

Mikhil Milton
M.Sc. Agronomy, School of Agriculture, Lovely Professional University, Phagwara Punjab, India

Dr. Dipti Bisarya
Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Vinai Kumar
Assistant Professor, Tantharker Mahaveer University, Moradabad, Uttar Pradesh, India

AK Singh
Department of Agricultural Economics, College of Agriculture, Campus Asamgarh, NDUAT, Ajodhya, Uttar Pradesh, India

Chandra Mohan Mehta
Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Corresponding Author:
Dipti Bisarya
Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Microbial fertilizers: Their potential impact on environment sustainability and ecosystem services

Mikhil Milton, Dr. Dipti Bisarya, Vinai Kumar, AK Singh and Chandra Mohan Mehta

DOI: https://doi.org/10.22271/chemi.2020.v8.i6sg.11120

Abstract
Microbial fertilizers have been used by farmers in agriculture for more than a century starting from rhizobia inoculants to a more recent Plant Growth Promoting rhizobacteria (PGPR) for increasing the nitrogen fixation and synthesis of plant hormones. Biofertilizers consists of microorganism that improves the nutrient content of the soil and enhances their availability to the crops. Pant nutrients represent the most crucial component of sustainable agriculture. At present, soil management approaches are largely dependent on chemical-based inorganic fertilizers which have posed a serious threat to human health and the ecosystem. Even though the usage of various chemical fertilizers and pesticides has provided high yield and consequently, population growth over the last century. The environment can no longer tolerate these practices as it has sustained significant damage such as loss of soil quality, atmospheric pollution, high eutrophication, and groundwater contamination. Thus maintaining food security along with environmental sustainability has become a massive challenge. However, the adoption of bio fertilizers represents a dependable and eco-friendly solution. Biofertilizers being organic in nature holds a vast expectation in fulfilling nutrient requirements, soil and water quality thus providing a low-cost approach compared to synthetic fertilizers in managing crop yield without causing much harm to the environment. Biofertilizers are becoming an irreplaceable component in Integrated Nutrient Management in order to achieve sustainability in agriculture. This review paper brings to light the potential effects of biofertilizers on ecosystem services and environmental sustainability.

Keywords: Microbial fertilizers, rhizobia inoculants, PGPR, ecosystem, eutrophication, pesticides

Introduction
Soil nutrients are critical for continuous growth and efficient production of crops thereby meeting the demands of the ever-increasing population with healthy food. India needs 280 MT of food grains to meet the requirement of the population (Singh *et al.*, 2016)[39]. Fertilizers are the main source of nutrients and hence agriculture is completely relied on fertilizers for increasing the yield of the crops. Fertilizers include synthetic, organic, or biofertilizers and their characteristics are different and each may possess a different ability to improve the yield of the crops (Chen, 2016) [6]. Chemical fertilizers are widely used to fulfill the nutrient requirement of the crops as they provide rapid results by providing nutrients over a short period of time. The nutrients are provided in high concentration which results in accelerated growth but causes a massive toll on the environment polluting both land and water by the deposition of harmful chemicals (Mahdi *et al.*, 2010) [41]. This practice became much prominent after the green revolution in India. Green revolution bought about a great change in the Indian agriculture scenario with the usage of high-yielding varieties, nutrient management (synthetic and organic fertilizers), and agriculture chemicals including pesticides, fungicides, and herbicides. These practices made India sufficient during the time of post-independence (Dotaniya *et al.*, 2014) [17]. Extensive usage of chemical fertilizers adversely affected the soil health reducing soil productivity. Increased ratios of fertilizers application i.e. 61:7:19:2:1 and 61:4:18.7:1 were practiced in Punjab and Haryana instead of the appropriate ratio of 4:2:1 (NAAS, 2014). This leads to a decrease in the yield and multi-nutrient deficiency in crops. Biofertilizers are considered to be among the most promising means to improve the productivity of the crop in an environment-friendly manner. Microbes present in biofertilizers consist of growth-promoting characteristics which play a pivotal role in optimizing various

International Journal of Agriculture Sciences
ISSN: 0975-3710&E-ISSN: 0975-9107, Volume 14, Issue 3, 2022, pp. 11194-11195
Available online at http://www.bioinfopublication.org/journal.php?opt=

Review Article

SYSTEM OF FLOWER'S MARKETING CHANNELS IN INDIA

SINGH A.K.*[1], YADAV P.[1], VIMLESH KUMAR[2], SINGH K.K.[3], BISRYA D.[3] AND VINAY KUMAR[4]
[1]College of Agriculture, Rewa, Azamgarh, 276001, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, 224229, Uttar Pradesh, India
[2]Department of Agricultural Economics, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, 224229, Uttar Pradesh, India
[3]School of Agriculture, Lovely Professional University, Phagwara, 144001, Punjab, India
[4]Veerbhandar Maheveer University, Moradabad, 244001, Uttar Pradesh, India
*Corresponding Author: Email - aseangh81@gmail.com

Received: June 23, 2021; Revised: March 28, 2022; Accepted: March 27, 2022; Published: March 30, 2022

Abstract: In the country, large numbers of flowers are grown in different parts based on soil and climate. There are also depending on likings and preferences of the people for a specific type of flower or flowers such as temple garlands, decorative garlands or orchids. Important flowers are rose, marigold, chrysanthemum, jasmine, lily tuberose, aster, zinnia, carnation, gladiolus, gaillardia etc. Flowers are tender and hence highly perishable. They are generally used in fresh form but they have very short shelf life. This poses great problems in their marketing, particularly long distance marketing. In this review paper, we have observed channels of marketing flowers and duly highlight the cost of marketing, problems and profit in this business. In the conclusion, we have also demanded the well organised marketing system for the improvement of marketing of flowers in the country.

Keywords: Flower cultivation, Marketing channels

Citation: Singh A.K., et al., (2022) System of flower's Marketing Channels in India. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 3, pp.- 11194-11195.

Copyright: Copyright©2022 Singh A.K., et al., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: P. K. Singh, Rakesh Roy, Er Prabhat Kumar Dhara, Dr Lawai Mohammad, Dr Y A Shinde

Introduction

Flowers are very intimately associated with most social and religious activities in the country. In social life, flowers are offered to welcome, to felicitate and to greet friends or relatives and guests in functions. Flowers are needed in all the religious ceremonies and functions including marriages. Garlands and big wreaths are offered on dead bodies of martyrs, very important persons, and national heroes as a mark of respect and gratitude for their work and sacrifice. Flower is a token of love and tenderness. They are most wanted because of they are colourful and fragrant. Flowers are also used for extracting essential oils, which are used in perfumes. Many flowers have medicinal values and hence are used in Ayurveda. Therefore, flowers of different kinds are always in demand and there is need of understanding and improving marketing of flowers in India as well as world [1-10].

Marketing channels

Flower cultivation is concentrated in the hinder-land of big cities like Mumbai, Pune, Bangalore, Mysore, Chennai, Calcutta, Delhi etc., But with the development of quick transport facilities and refrigerated or insulated vehicle, flowers are transported to distant markets including exports. For successful marketing of flowers, well-developed markets and well-organised marketing system is necessary [11-20].

In the case of rose flower mostly following marketing channels were involved:

Channel I - Producer → Commission agent → Retailer → Consumer

Channel II - Producer → Retailer → Consumer

Channel III –Producer → Consumer

Since metro and cities as like Delhi, Mumbai, Chennai, Kolkata etc. is a big market, therefore more than 50 % flower were sold through channel I and remaining were sold through Channels II and Channels III. Thus, the local market area was less spread. Marketing costs, margins and producer's share in consumer's rupee were more in marketing channel II in comparison to marketing channel I for roses sold after marketing garlands. There was increase in value of roses when sold in the form of garlands.

In the case of orchids, mostly following marketing channels were involved:

Channel – I – Producer → Local buyer → Consumer

Channel – II – Producer → Wholesaler → Retailer → Consumer

The Cost of marketing worked out to nominal per spike. In this transport cost was the major followed by packing. Marketing Orchids in the distant markets was more remunerative.

In the case of Gladiolus mainly two marketing channels were found:

Channel- I – Producer → Wholesaler → Retailer → Consumer

Channel- II – Producer → Contractor → Retailer → Consumer

Channel – I was more important, produce passing through this channel than channel – II produce passing through it. This showed that it is more remunerative to sell flowers in the market where the forces of demand and supply are clearer and price determination is competitive and open or transparent.

In the case of Jasmine popular marketing channel was

Producer – Trader-cum-Commission agent – Retailer – Consumer' found.

In the case of marigold marketing channels were identified

Channel – I – Producer → Commission agent → Retailer → Consumer

Channel – II – Producer → Retailer → Consumer

Channel – III – Producer → Consumer

The flowers were sold in two ways

(i)In Loose form

(ii)In the form of garlands

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1021-1022

Mukesh Kumar
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Gaurav Panday
PhD Scholar Dept. of Livestock Production Management, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

KN Singh
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

SS Sanger
Assistant Professor Dept. of Livestock Product Technology, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

PK Chaudhary
Assistant Professor Dept of Vet. Physiology & Biochemistry, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Pramod Kumar
Assistant Professor Dept of Vet. Physiology & Biochemistry, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Correspondence
Mukesh Kumar
Assistant Professor Dept. of Veterinary Anatomy, College of Veterinary Sciences and Animal Husbandry N.D.U.A.T. Faizabad, Uttar Pradesh, India

Comparative studies on urinary system of Aseel and Rhode Island Red (RIR) breeds of poultry

Mukesh Kumar, Gaurav Panday, KN Singh, SS Sanger, PK Chaudhary and Pramod Kumar

Abstract
The present comparative study was conducted to evaluate the urinary system of Aseel and Rhode Island Red (RIR) breeds of poultry and experiments was done on 24 apparently healthy birds of Aseel and RIR breeds of poultry which were divided into grower and adult groups. Each kidney was divided into cranial, middle and caudal divisions by the grooves present on the ventral surface. In RIR grower as well as in adults, weight, volume and maximum width of kidney to body weight was more in RIR grower than Aseel. While, in adult birds it was more in Aseel than RIR. The ureter had two parts, renal and pelvic. Highly significant difference was observed in the weight, length and volume of both the ureters of an RIR grower than Aseel.

Keywords: Aseel, RIR, Gross morphology, Urinary system

Introduction
Avian urinary system has consisted of the kidney and ureter only. Kidneys play an important role in maintaining homeostasis. The ureter is an important organ, which carries urine to the cloaca. There was no literature available on the gross studies of the urinary system of this breed. The present work was undertaken to study the comparative gross morphology of the urinary system of Aseel and RIR breeds of poultry.

Materials and Methods
The experiment was done on 24 apparently healthy birds of 2 groups of RIR and Aseel breeds of poultry irrespective of sex. The birds were divided into grower and adult (group I and II) respectively. Both the groups had 12 birds, 6 birds of each breed. After taking the body weight, birds of the specified age group were sacrificed by cutting jugular vein and common carotid artery. Kidney and ureter were collected and their length and width were recorded by using Vernier caliper, weight was taken with the help of electronic monopan balance whereas, volume was taken with the help of the water displacement method. The data were statistically analyzed by using analysis of independent mean "T" test as per Snedecor and Cocharan (1994) [2].

Results and Discussion
Kidney: The colour of the kidneys was reddish brown. The right and left kidneys were retroperitoneal and present symmetrically in a depression on ventral surface of synsacrum and renal fossa of ilium. Depression on the synsacrum was extended upto the distal third. The cranial margin of each kidney was extended immediately caudal to the lungs between the sixth and seventh thoracic vertebrae. These extended upto the rostral third of gizzard in grower birds while, in adult birds upto the distal third of gizzard. On the surface of the kidney small projections were seen in all three divisions. This might be the external surface of the renal lobule.

The dorsal surface of the kidney had the impression of lumbosacral mass, which extended from the medial border to the middle of the kidney. The impressions were shallow in grower birds that an adult bird in both breeds. Each kidney was divided into cranial, middle and caudal divisions by the grooves present on the ventral surface. The groove was shallow and directed caudo-laterally from median plane. However, (Nubipour *et al.* 2009) [1] started that the groove was transverse. External iliac artery was present in the groove between the cranial and middle division. Groove containing ischiatic artery seprated the middle and caudal division of the kidney.

In both breeds and age groups, the shape of the kidney was similar. The cranial division was oval elongated, middle division was slender and caudal division was irregular.

International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
IJCS 2018; SP4: 72-80

(Special Issue -4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 21-24 December, 2018)

Pharmacological properties of *Boerhavia diffusa*: A review

Rajesh Kumar, S Gautam, KD Singh, P Kumar, Nilufar Haque, Vibha Yadav, R Kumar, RP Diwakar, Rishikant and SB Kumar

Rajesh Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

S Gautam
Department of Animal Nutrition CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

KD Singh
Department of Instructional Livestock Farm Complex CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

P Kumar
Department of Veterinary Biochemistry and Physiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Nilufar Haque
Department of Vety, Biochemistry and Physiology, SDAU, SK Nagar, Gujarat, India

Vibha Yadav
Department of Veterinary Microbiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

R Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

RP Diwakar
Department of Veterinary Microbiology, CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Rishikant
Department of Veterinary Pharmacology and Toxicology CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

SB Kumar
Department of Soil Science and Agril. Chemistry, BAU, Ranchi, Jharkhand, India

Correspondence
Rajesh Kumar
Department of Veterinary Gynaecology and Obstetrics CV Sc. & AH, NDUAT, Kumarganj, Faizabad, Uttar Pradesh, India

Abstract
Now a day due to various side effects of allopathic medicine, scientists of pharmaceutical industries and research centers have been engaged to explore the pharmacological properties of herbal plants. The present review explains the pharmacological properties of *Boerhavia diffusa* plant. This plant commonly known as punarnava, is herb of family Nyctaginaceae. *B. diffusa* known to have medicinal properties and used as Ayurvedic medicine in India. Battery of phytochemicals like alkaloids, flavonoids, rotenoids and phytosterols has been found in the plant which are responsible for its various pharmacological properties such as analgesic, anti-*inflammatory*, diuretic, hepatoprotective, immunomodulator and nephroprotective, antiulcer and antihistaminic etc. Moreover, several new phytochemicals are discovered which again validate its medicinal importance. This review presents the evidence-based pharmacological properties of *B. diffusa*. In conclusion *B. diffusa* contain many bioactive phytochemicals that may be use as prophylactic as well as for cure of various ailments of human and animals.

Keywords: *Boerhavia diffusa,* bioactive phytochemicals, pharmacological properties, hepatoprotective and Immunomodulator

Introduction
Boerhavia diffusa, a perennial herb with stout root stock and many procumbent branches, flowers pale rose coloured, small, short-stalked; fruits highly viscid and one-seeded with many vernacular names viz. Punarnava, Raktapunarnava, Shothaghni, Kathillaka, Kshudra, Varshabhu, Raktapushpa, Varshaketu amd Shilatika in India. The genus *Boerhavia* (often spelled as Boerhaavia) was named in honor of Hermann Boerhaave (1668–1738), an eighteenth century Dutch botanist, humanist and physician at the University of Leiden, while the species got the name from typical diffuse branching. The botanical name of the plant is often written in the literature as *Boerhaavia diffusa* (Hiruma-Lima *et al*., 2000) [33], but Linnaeus Latinized Boerhaave's name to Boerhavius and adopted the spelling *Boerhavia diffusa*, which is the correct spelling to be used (Spellenberg, 2004) [75].
Punarnava is a very important medicinal herb of Ayurveda. Its name is derived from two words, *Punar* (= once again /regaining/restoring) and *Nava* (=new, renew or young), so the literal meaning of the name is, one which becomes new or young again. This name signifies the rejuvenating property of Punarnava. It is a Rasayan herb of Ayurveda which renews the body or restores youth.

***Boerhavia diffusa* (Punarnava)**	
Kingdom	Plantae
Division	Angiosperm
Class	Eudicots
Order	Caryophyllales
Family	Nyctaginaceae
Genus	*Boerhavia*
Species	*diffusa*

RESEARCH ARTICLE

Impact of Different Therapeutic Protocols on Blood Biochemical Markers and Fertility in Anestrus Sahiwal Cows

Safayat Husain[1], Rajesh Kumar[1]*, Bhoopendra Singh[1], Sushant Srivastava[1], Rabindra Kumar[1], Pramod Kumar[2], Nilufar Haque[3]

Abstract

Bovine anestrus syndrome is a multifactorial disorder of the reproductive system. The problem is severe in suburban and rural areas of the country. The present study was aimed to evaluate the effect of different therapy on biochemical parameters and fertility response in 24 anestrus Sahiwal cows. Anestrus cows were randomly divided into four equal groups of six animals each, and were subjected with Lugol's iodine 2%, cervical painting with per rectal massage of genitalia thrice on alternate day (G1, n=6), XXX herbal bolus 1 bid for 2 days, repeated on day 11 & 12 later in non-respondents (G2, n=6), and modified ovsynch protocol which consisted of 100 mg hydroxy progesterone caproate injected daily s/c for 6 days followed by inj. GPG (G3, n=6), while one group was kept as untreated control (G4, n=6). Blood samples were collected thrice from all cows, *i.e.*, pretreatment day-0 (S1); post-treatment at induced estrus/AI (S2) and day 21 post-AI (S3), for estimation of serum progesterone and biochemical constituents. In general, except progesterone, the mean values of serum glucose, total cholesterol, total protein, albumin, calcium and phosphorus were significantly ($p<0.05$) lower at d-0 than the corresponding values at induced estrus and day 21 post-AI in treatment groups G1, G2 and G3; whereas, the periodic values did not differ significantly in control group G4. The estrus induction response was 100% in all treated cows with comparable conception rates among different therapeutic protocols (83.33, 66.66 & 83.33 %) as against nil response in control group G4. The results suggest that bovine anestrus syndrome can be managed well with comparatively low-cost Lugol's iodine and herbal therapeutics.

Keywords: Anestrus, Biochemical parameters, Estrus induction, Sahiwal cows, Therapy

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.4.11

Introduction

Bovine anestrus syndrome is a multifactorial disorder of the reproductive system, characterized by the absence of estrus either due to lack of estrus or failure of its detection. The problem is severe in suburban and rural areas of the country. Wide variation in the incidence of anestrus has been reported in cattle and buffalo across the country (Butani *et al.*, 2008 and Ashoo *et al.*, 2020). The clinical syndrome can be diagnosed using anamnesis, ovarian palpation, progesterone estimation, and ultrasonography; being multifactorial, it can be treated according to their cause; however, there is no single panacea to correct it. Many non-hormonal and hormonal drugs have been tried and tested to treat anestrus syndrome (Kumar et al., 2011; Dhami et al., 2015; Kumar *et al.*, 2020; Kumar *et al.*, 2021). Among herbal therapeutics, various types of tropical plants are used traditionally to augment reproductive performance. Some plants contain secondary metabolites which are effective in inducing estrus in post-partum anestrus cows. The hormonal drugs being costly cannot always be affordable under field conditions. Thus, the present study was aimed to assess comparative efficacy of Lugol's iodine, XXX bolus (herbal heat inducer) and modified ovsynch protocol on fertility response in post-partum anestrus cows and its effect on blood biochemical profile.

Materials and Methods

The study was carried out under farm conditions during the year 2019-20 in the semi-urban areas of Ayodhya district in UP, India. The experimental protocol was approved by Institutional Animal Ethics Committee of the College. At preliminary stage, 34 cows were selected on the basis of history, breeding records and per-rectal examination. The

[1]Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, UP-224229.

[2]Department of Veterinary Physiology & Biochemistry College of Veterinary Science & Animal Husbandry Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, UP-224229.

[3]Directorate of Research Extension & Farm, WBUAFS, Kolkata, West Bengal, India

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, ANDUAT, Ayodhya, U.P., India, e-mail: drrajesh25@gmail.com

How to cite this article: Husain, S., Kumar, R., Singh, B., Srivastava, S., Kumar, R., Kumar, P., & Haque, N. (2021). Impact of Different Therapeutic Protocols on Blood Biochemical Markers and Fertility in Anestrus Sahiwal Cows. Ind J Vet Sci and Biotech, 17(4), 49-53.

Source of support: Nil

Conflict of interest: None.

Submitted: 20/03/2021 **Accepted:** 21/08/2021 **Published:** 10/10/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 997-998

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

Micrometry of renal corpuscles and renal tubules in *Marwari* Sheep (*Ovis aries*)

Krishna Nand Singh, Sanjeev Joshi, Rakesh Mathur, Mukesh Kumar and Pramod Kumar

Abstract

The microscopic studies of Renal tubules of 6 *Marwari* sheep showed that there was no significant difference between juxtamedullary renal corpuscles and cortical corpuscles. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns. The average diameter of PCT, DCT, collecting duct, thick and thin segment of loop of Henle was 49.91±2.02, 39.14±1.82, 42.80±0.99, 32.85±1.11, and 19.50±0.76 micron respectively.

Keywords: *Marwari* sheep, Micrometry, Renal corpuscles, loop of Henle

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. In mammals the kidneys are compound tubular glands and the chief excretory organs of the body. They have a major role in the maintenance of fluid and electrolyte balance and in control of the blood pressure.

Materials and Methods

The diameter of various parts of uriniferous tubule was measured from random samples seen under light microscope in high power (400X). The Micrometry of Renal tubules across various areas were recorded by using occular micrometer after calculating calibration with stage micrometer to record the observations on mean diameters of various parts of nephron and collecting duct.

Results and discussion

The Renal Corpuscles

Renal corpuscles in the cortical region (Fig.1) had an average transverse diameter of 134.79±5.47 microns and average vertical diameter was 98.99±3.83 microns. The average transverse diameter of juxtamedullary renal corpuscles was 158.63±2.94 microns and average vertical diameter 109.42±3.44 microns. The glomeruli in the cortical region had an average transverse diameter of 109.35±2.85 microns and average vertical diameter of 84.41±2.18 microns. The average transverse diameter of juxtamedullary glomeruli was 128.55±2.18 microns and average vertical diameter was 94.7±1.72 microns (Table 1).

The Proximal Convoluted Tubule

The diameter of the proximal convoluted tubule varied from 39.4 to 67.9 microns, with an average of 49.91±2.02 microns (Table 2). It was similar to the findings of Trautmann and Fiebiger (1957) [4] who stated that the diameter of proximal convoluted tubule ranged from 45 to 60 microns in domestic animals. Yadava and Calhoun (1958) [5] recorded an average diameter of proximal convoluted tubule to be 56, 50, 45 and 45 microns for horse, ox, sheep, and goat respectively. Whereas Ommer and Mariappa (1970) [3] reported in Indian buffalo that an average diameter was 47.4 microns with a range of 40.7 to 64.7 microns and Beniwal (1995) [1] reported in camel that an average diameter was 76.63 microns with a range of 43.98 to 117.28 micron.

CamScanner
07-13-2022 22.33.pdf

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF VITAMIN E AND ZINC ON CORTISOL HORMONE DURING PERIPARTUM PERIOD IN CROSS BRED COWS

Pankaj Kumar Maurya[1]*, Anjali Aggarwal[2], P. K. Choudhary[1], Pramod Kumar[1], Gulab Chandra[3], A. K. Singh[4] and Ovais Aarif[5]

[1]C.V.Sc. & A.H., N. D. University of Agri. & Tech., Kumarganj, Ayodhya (UP) India,
[2]Dairy Cattle Physiology Division, NDRI, Karnal (Haryana),
[3]COVAS, SVPUAT, Meerut (U.P.), [4]C.V.Sc. & A.H., Rewa (M.P.), [5]FVSc & AH, SKUAST K

Abstract

The study was conducted to investigate effect of vitamin E and zinc on cortisol hormone during peripartum period in Karan Fries cows. Sixteen pregnant Karan Fries (KF) cows were selected from the herd of National Dairy Research Institute (NDRI) Karnal, on the basis of their body weight, BCS and parity. Eight cows were kept in control group and other eight cows in treatment group which were supplemented with 1000 IU vitamin E and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Cortisol hormone. Body weight and Body condition score (BCS) of all the experimental animals were recorded on the day of blood collection. Plasma cortisol was significantly ($P<0.001$) lower in treatment group as compared to control group (2.98 vs. 3.10 ng/ml). There was a steady increase in the body weight of control and treatment cows towards parturition and was found a significant ($P<0.001$) difference between the control and treatment groups. The body condition score of control and treatment groups decreased by 33.05% and 17.76% respectively after calving. This showed that the control group cows lost significantly ($P<0.001$) more body condition as compared to treatment group cows. The results of this study indicated that supplementation of vitamin E and zinc have beneficial effects in changing cortisol level in this way that improves body condition and decreases the effect of parturition stress in the animals.

Keywords: Cortisol, Body Condition Score, Energy Metabolites, Peripartum period, Vitamin E, Zinc

Introduction

Cortisol is a steroid hormone that helps the body respond to stress. It is also called the stress hormone. It is released in response to stress and low blood glucose concentration. It is the principal glucocorticoid during the reproduction and lactation of cows [1]. Adrenal secretion of cortisol is modulated by a complex negative feedback mechanism involving the central nervous system, hypothalamus, pituitary and adrenals [2]. The synergistic action of endogenous cortisol along with other hormones has been found to be critical for parturition and initiation of lactation in domestic animals [3]. At term the corticosteroid concentration rises in the plasma of peripartum cows [4, 5a]. Plasma total cortisol level increased from 2.13 ng/ml to 2.62 ng/ml till one day prepartum and increased to 6.08 ng/ml at parturition in crossbred cows. The level decline from 3.42 ng/ml on 1 day postpartum to 2.49 ng/ml at 3 day postpartum [6]. In Murrah buffaloes level of cortisol was found 1.46 ng/ml at 30 day prepartum which increased to 3.78 ng/ml at parturition and decline to 1.89 ng/ml at 3 day postpartum[2].

Cortisol concentrations have been used as a physiological marker of stress. During heat acclimation there is reduction of plasma cortisol that helps in reduction of heat production of animals[7]. An initial increase in cortisol occurs due to acute heat stress followed by a decline after prolonged exposure in cows. The animals adjust physiologically to elevated heat loads by decreasing adrenal corticoid output [7]. Cortisol concentrations have been found lower in high producing cows at day 30 than at day 90 or in nonlactating cows due to reduced pulse amplitude. Low cortisol concentrations likely participate in the enhanced production observed in high producing cows [8]. Heat exposure at temperature above 40°C has been found to raise the cortisol level to almost double the pre-exposure levels [9]. Similar results were also found by others in hot-dry, hot-humid and winter seasons in crossbred cows (4.17, 4.35 and 2.09 ng/ml respectively) [10].

Materials and Methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). Karnal is situated on an altitude of 250 meter above mean sea level, latitude and longitude position being 29°42" N and 79°54" E respectively. The maximum ambient temperature in summer goes up to 45°C and minimum temperature in winter comes down to 0°C with a diurnal variation in the order of 15-20°C. For the present study 16 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 8 cows kept in Control group and other 8 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of vitamin E and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum. Animals were maintained in open area with asbestos roof in the sides of the open area, where the animals were offered feed. The open area had brick floor. The animals were free to move inside the controlled open area. All the animals were fed as per the standard feeding practices followed at the NDRI farm.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 1,200×g at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Cortisol.

Sample analysis

Blood sample was analyzed for cortisol. Plasma Cortisol was determined by "Cortisol EIA kit" from Cayman Chemical Company, Ann Arbour, USA. Body weight and Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two-way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software.

Results and Discussion

Cortisol

The mean±SE of plasma cortisol concentration of control cows was 2.87±0.09 ng/ml 60 days before calving and on the day of calving it increased to 3.24±0.07 ng/ml. Further, in treatment group the plasma cortisol concentration was 2.78±0.03 ng/ml 60 days before calving and on the day of calving it increased to 3.10±0.03 ng/ml. In present study, the overall mean±SEM of plasma cortisol concentration was found significantly ($P<0.001$, Table 2) lower in treatment group as compared to control group. Plasma levels of cortisol varied between 2.3-3.5 ng/ml during pre and postpartum in Holstein cows [11]. After 7 days of calving it's level started decreasing up to 60 day of lactation.

ADOPTION LEVEL OF POULTRY FARMERS REGARDING THE SCIENTIFIC BROILER FARMING PRACTICES IN EASTERN PLAIN ZONE OF UTTAR PRADESH

Mustak Ahmad[1], H.C.Verma*[2], R.K. Singh[3], Puspendra Kumar Singh[4] and Vijayendra Verma[1]

[1] M.V.Sc student C.V.Sc. & A.H., N.D.U.A.T., Kumarganj, Faizabad

[2]Assistant Professor Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad.

[3]Associ .Prof. Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad [4] Guest Faculty, Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad.

Abstract:

The present study was conducted in eastern plain zone (Faizabad and Ambedker nagar district) of Uttar Pradesh. Faizabad and Ambedkar Nagar district of Uttar Pradesh were selected purposively which has maximum poultry farmers. Data was collected by pre-structured interview schedule, from each district there was two blocks are also selected purposively which has maximum numbers of poultry farmers. From each selected block 24 poultry farmers were selected by applying simple random sampling technique. Total 96 poultry farmers were selected for the study. Those poultry farmers were selected which has minimum 500 flock size. Majority of the Poultry farmers (41.67 %) had the medium adoption level regarding scientific broiler farming practices (6-8), followed by whereas 40.63 percent in low level (<6) of adoption and 17.71 percent high level (>8) of adoption respectively about housing, brooding, feeding and health care management.

Keywords: *Adoption level, broiler farming, housing, brooding, feeding and health care management.*

Introduction:

Rogers (2003) defined adoption as a decision to make full use of an innovation as the best course of action available. In the present study, adoption refers to the extent to which selected scientific broiler farming practices are used by a broiler farmer completely and partially at his farm. It is estimated that in India 90 percent of the poultry in the Southern region, 80 per cent in the Western region, and 70 per cent in the Eastern region and 10 per cent in the Northern region were under a vertically integrated system (Rajan 2006). The Indian poultry sector with 7.3 per cent growth in poultry population, has witnessed one of the fastest annual growth of about 8 per cent in eggs and 10 per cent in meat production, over the last decade (2003-2013) amongst all animal based sectors (CARI vision 2050). The high growth has placed India at 3rd position in egg production after China and USA with a production of 75 billion eggs and 5th position in chicken meat after USA, China, Brazil and Mexico (Kornel, 2008) with a production of 3.7 million metric tons of chicken meat. Poultry farming plays an effective role in improving the economic status of the rural people by increasing their income besides providing nutritious food through meat. According to 19th livestock census 2012, there are 18.66 million poultry birds in Uttar Pradesh of which, 7.24 million are farm poultry. Among the farm poultry, broilers constitute 6.6 millions.

Material And Methodes:

The present study was conducted in eastern plain zone (Faizabad and Ambedker nagar district) of Uttar Pradesh, from each district there was two blocks are also selected purposively which has maximum numbers of poultry farmers. From each selected block 24 poultry farmers were selected by applying simple random sampling technique. Total 96 poultry farmers were selected for the study. Those poultry farmers were selected which has the minimum 500 flocks size of broiler farming at the time of investigation. The primary data was collected by personal interview method using a structured interview schedule. The collected data were tabulated, scored and analyzed in the light of the objective.

To find the adoption level of scientific broiler farming practices among poultry farmers.

Result And Discusion:

Table 1.1: Different adoption level scientific broiler farming practices of poultry farmers according to their existing practices (N=96)

S.No.	Respondents	Categories	Frequency	Percentage
1.	Adoption level Housing Management Practices	Low (< 1)	51	53.12
	Range (1-3)	Medium (1-2)	35	36.46
	Mean (1.58)	High (>2)	10	10.42
2.	Adoption level Brooding management practices	Low (< 1)	33	34.37
	Range (1-3)	Medium (1-2)	45	46.87
	Mean (1.87)	High (>2)	18	18.76
3.	Adoption level Feeding management practices	Low (< 1)	33	34.37
	Range (1-3)	Medium (1-2)	45	46.87
	Mean (1.84)	High (>2)	18	18.76
4.	Adoption level Health-care management practices	Low (< 1)	36	37.50
	Range (1-3)	Medium (1-2)	44	45.83
	Mean (1.79)	High (>2)	16	16.67

Table 1.1 reveal that in case of Adoption level regarding housing management of poultry farmers adopted that majority of the respondents (53.12%) had the low level (<1). Whereas 36.46 percent in medium level (<1-2) of adoption and 10.42 percent high level (>2) of adoption level of poultry farming were found in the study area respectively. In case of adoption level regarding brooding management of poultry farmers revealed that majority of the respondents (46.87%) had the medium level (1-2). Whereas 34.37 per

ADOPTION LEVEL OF POULTRY FARMERS REGARDING THE SCIENTIFIC BROILER FARMING PRACTICES IN EASTERN PLAIN ZONE OF UTTAR PRADESH

Mustak Ahmad[1], H.C.Verma*[2], R.K. Singh[3], Puspendra Kumar Singh[4] and Vijayendra Verma[1]

[1] M.V.Sc student C.V.Sc. & A.H., N.D.U.A.T., Kumarganj, Faizabad

[2]Assistant Professor Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad.

[3]Associ .Prof. Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad [4] Guest Faculty, Deptt. of Veterinary and Animal Husbandry Extension Education, C.V.Sc.&A.H., N.D.U.A.T.,Kumarganj, Faizabad.

Abstract:

The present study was conducted in eastern plain zone (Faizabad and Ambedker nagar district) of Uttar Pradesh. Faizabad and Ambedkar Nagar district of Uttar Pradesh were selected purposively which has maximum poultry farmers. Data was collected by pre-structured interview schedule, from each district there was two blocks are also selected purposively which has maximum numbers of poultry farmers. From each selected block 24 poultry farmers were selected by applying simple random sampling technique. Total 96 poultry farmers were selected for the study. Those poultry farmers were selected which has minimum 500 flock size. Majority of the Poultry farmers (41.67 %) had the medium adoption level regarding scientific broiler farming practices (6-8), followed by whereas 40.63 percent in low level (<6) of adoption and 17.71 percent high level (>8) of adoption respectively about housing, brooding, feeding and health care management.

Keywords: *Adoption level, broiler farming, housing, brooding, feeding and health care management.*

Introduction:

Rogers (2003) defined adoption as a decision to make full use of an innovation as the best course of action available. In the present study, adoption refers to the extent to which selected scientific broiler farming practices are used by a broiler farmer completely and partially at his farm. It is estimated that in India 90 percent of the poultry in the Southern region, 80 per cent in the Western region, and 70 per cent in the Eastern region and 10 per cent in the Northern region were under a vertically integrated system (Rajan 2006). The Indian poultry sector with 7.3 per cent growth in poultry population, has witnessed one of the fastest annual growth of about 8 per cent in eggs and 10 per cent in meat production, over the last decade (2003-2013) amongst all animal based sectors (CARI vision 2050). The high growth has placed India at 3rd position in egg production after China and USA with a production of 75 billion eggs and 5th position in chicken meat after USA, China, Brazil and Mexico (Kornel, 2008) with a production of 3.7 million metric tons of chicken meat. Poultry farming plays an effective role in improving the economic status of the rural people by increasing their income besides providing nutritious food through meat. According to 19th livestock census 2012, there are 18.66 million poultry birds in Uttar Pradesh of which, 7.24 million are farm poultry. Among the farm poultry, broilers constitute 6.6 millions.

Material And Methodes:

The present study was conducted in eastern plain zone (Faizabad and Ambedker nagar district) of Uttar Pradesh, from each district there was two blocks are also selected purposively which has maximum numbers of poultry farmers. From each selected block 24 poultry farmers were selected by applying simple random sampling technique. Total 96 poultry farmers were selected for the study. Those poultry farmers were selected which has the minimum 500 flocks size of broiler farming at the time of investigation. The primary data was collected by personal interview method using a structured interview schedule. The collected data were tabulated, scored and analyzed in the light of the objective.

To find the adoption level of scientific broiler farming practices among poultry farmers.

Result And Discusion:

Table 1.1: Different adoption level scientific broiler farming practices of poultry farmers according to their existing practices (N=96)

S.No.	Respondents	Categories	Frequency	Percentage
1.	Adoption level Housing Management Practices	Low (< 1)	51	53.12
	Range (1-3)	Medium (1-2)	35	36.46
	Mean (1.58)	High (>2)	10	10.42
2.	Adoption level Brooding management practices	Low (< 1)	33	34.37
	Range (1-3)	Medium (1-2)	45	46.87
	Mean (1.87)	High (>2)	18	18.76
3.	Adoption level Feeding management practices	Low (< 1)	33	34.37
	Range (1-3)	Medium (1-2)	45	46.87
	Mean (1.84)	High (>2)	18	18.76
4.	Adoption level Health-care management practices	Low (< 1)	36	37.50
	Range (1-3)	Medium (1-2)	44	45.83
	Mean (1.79)	High (>2)	16	16.67

Table 1.1 reveal that in case of Adoption level regarding housing management of poultry farmers adopted that majority of the respondents (53.12%) had the low level (<1). Whereas 36.46 percent in medium level (<1-2) of adoption and 10.42 percent high level (>2) of adoption level of poultry farming were found in the study area respectively. In case of adoption level regarding brooding management of poultry farmers revealed that majority of the respondents (46.87%) had the medium level (1-2). Whereas 34.37 per

Biological Forum – An International Journal **14(2): 679-682(2022)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Awareness Regarding Hygiene Management Practices Followed by Dairy Farmers in Sultanpur District of Uttar Pradesh

Ajay Kumar[1], H.C. Verma[1*], R.K. Singh[1], R.P. Diwakar[2], Rajesh Kumar[3], V.K. Pal[4] and Mustak Ahmad[5]

[1]Department of Veterinary and Animal Husbandry Extension Education,
College of Veterinary Science & AH, Achary Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (Uttar Pradesh), India.
[2]Department of Veterinary Microbiology,
College of Veterinary Science & AH, Achary Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (Uttar Pradesh), India.
[3]Department of Veterinary Gynaecology & Obstetrics,
College of Veterinary Science & AH, Achary Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (Uttar Pradesh), India.
[4]Department of Veterinary Parasitology,
College of Veterinary Science & AH, Achary Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (Uttar Pradesh), India.
[5]Ph.D. Scholar, Department of Veterinary and Animal Husbandry Extension Education,
College of Veterinary Science & AH, Achary Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (Uttar Pradesh), India.

(Corresponding author: H.C. Verma)*
(Received 09 February 2022, Accepted 25 April, 2022)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The present study was carried by M.VSc student of Department of Veterinary & A.H. Extension Education, ANDUAT, Kumarganj, and Ayodhya out in Sultanpur district of Uttar Pradesh is an attempt to analyze the relationship of status of dairy farmers with their awareness regarding hygiene management practices. The information were composed with the help of pre design question schedule by contacting the sample dairy farmers personally the help of local leader in the research areaby random sampling method, for selection of district and block purposively due to the researcher is well equated about the work the socio-cultural status of the district which help in quick rapport building that is essential for authentic data collection .The information were generated from 120 dairy farmers from four blocks i.e. Kurebhar, Kurwar, Dhanpatganj, Baldirai selected for data collection, three villages from each randomly selected block were randomly selected with lottery method by preparing the list of the village where sufficient number of dairy farmers was available. Overall finding reported that the majority 35.83 percent of the dairy farmers were having medium, 32.50 Low and 31.67 high hygiene management practices like cleaning of housing & cleaning of floor, washing of animals, use of disinfection in animal shed, washing of animal udder at the time of milking, washing of hand at the time of milking, Clean milk production followed by dairy farmers in the study area.

Keywords: Awareness, Hygiene Management, Dairy farmer.

INTRODUCTION

Clean milk can be defined as milk produced from healthy mulch animal possessing normal flavor, devoid of dirt, and filth containing permissible limit of bacteria, and essentially free from adulterants, pathogens, various toxins, abnormal residues, pollutants, and metabolites.

The clean milk production (CMP) involves cleanliness at different phases of handling animals, processing, and transporting of milk and milk products. Stringent quality control and hygienic measures are required at a dairy farm level to maintain the milk quality. The milk quality is determined by aspects of composition and hygiene of milk. There are mainly four factors to be considered in CMP practices: Animal hygiene, milking hygiene, equipment hygiene, and processing hygiene. Contaminated milk deteriorates quickly and is a cause for health concerns. One of the major causes of illness in various countries is the transmission of diseases through food. Zoonosis is diseases and infections that are naturally transmitted between vertebrate animals and humans. Zoonosis constitutes 61% of all known infectious diseases. It may also be noted that of the 175 diseases considered to be emerging, 75% are zoonotic. We came out with that women play a significant role in livestock farming with a better performance rate

THERAPEUTIC MANAGEMENT OF OVERT PSEUDOPREGNANCY IN A BITCH: A CASE REPORT

Rajesh Kumar[1*], S.Srivastava[1], B. Singh[1], Rabindra Kumar[1], Sandeep Yadav[2], Pramod Kumar[3], Nilufar Haque[4], and S.S.Parikh[5]
Department of Veterinary Gynecology and Obstetrics, C.V.Sc.& A.H.
NDUAT, Kumarganj, Faizabad, UP. 224229.
[1]Department of Veterinary Gynaecology and Obstetrics
[2]Department of Veterinary Medicine
[3]Department of Veterinary Physiology and Biochemistry
[4]Department of Veterinary Physiology and Biochemistry, SDAU, SKNagar, Gujrat.
[5]Cattle Breeding Farm, JAU, Junagadh, Gujarat.

Abstract

Pseudopregnancy is an exaggerated physiological response experienced by any non-pregnant puberal bitch (unbred or have infertile mating) completing the luteal portion of an estrous cycle. Prolactin hormone play a central role in pathophysiology of pseudopregnancy. Pseudopregnancy may ensue due to increased concentration of prolactin or increased sensitivity to prolactin induced by a more rapid than normal decline of progesterone levels in the late luteal phase (Concannon and Lein, 1989). Pseudopregnancy is easy to diagnose and easy to treat with prolactin suppression therapy i.e. dopamine agonists. Ovariectomy is the only permanent preventive measure (Johnston, 1980; Jochle et al., 1989) if bitches are not intended for breeding.

Keywords: Bitch, pseudo-pregnancy, patho-physiology, sex steroids, prolactin and dopamine agonist.

Introduction

Term pseudopregnancy was first used by Ancel and Bouin (1911) abnormally long luteal phase of estrous cycle in rabbit. As for as bitch is concern pseudopregnancy is an exaggerated physiological response experienced by any non-pregnant puberal bitch(unbred or have infertile mating) completing the luteal portion of an estrous cycle. The term pseudopregnancy does not distinguish clinical condition (overt or clinical pseudopregnancy) from covert or physiological pseudopregnancy. However, the term pseudopregnacy signify clinical or overt pseudpregnancy unless mentioned otherwise.

Prolactin hormone play a central role in pathophysiology of pseudopregnancy. Pseudopregnancy may ensue due to increased concentration of prolactin or increased sensitivity to prolactin induced by a more rapid than normal decline of progesterone levels in the late luteal phase (Concannon and Lein, 1989). Syndrome usually begins after 6-20 weeks after estrus and exhibit the behavioral signs such as restlessness, nesting, aggression, licking of abdomen and mothering inaninmate object. Moreover, mammary development or hypertrophy (Concannon and Lein, 1986) which is more pronounced in caudal pair of mammary gland although entire chain of gland may be involved and lactation is often encouraged by self-nursing or by adaptation of unrelated neonates (Razzaque *et al*., 2008). On the other hand, Johnston (1980) reported other symptom such as vomiting, anorexia, polyurea, polydypsia and polyphagia. Usually syndrome is self-limiting and signs cease after 2-4 weeks unless complicated by occurrence of mastitis and mammary dermatitis which is unlikely (Razzaque *et al*., 2008).

The diagnosis of the syndrome is easy and can be made on the basis of history, abdominal palpation, and ultrasonography. Traditionally, sex steroids (estrogen, progesterone, and androgens) use to treat pseudopregnancy, which is in high doses either suppress pituitary prolactin or decrease sensitivity to prolactin (Allen, 1986; Arbeiter *etal*., 1988; Feldman and Nelson,1987; Jochle,1987; Voith, 1980; Johnston, 1980); But side effects of sex steroids outweigh its therapeutic use (Gobello *et al*., 2001). At present, inspite of sex steroid therapy, prolactin- suppression therapy by dopamine agonist or antiprolactin is treatment of choice. Ergot alkaloids (bromocriptin and cabergolin), a dopamine agonist, causes inhibition of prolactin secretion. This inhibition can be modulated indirectly by serotonin, which suppresses dopamine release and increases prolactin (Thorner *et al*., 1998). The most common ergot compounds used clinically to inhibit prolactin secretion are the dopamine agonists bromocriptine and cabergoline. Another ergot alkaloid, is a serotonin antagonist, and thus has a dopaminergic effect and thus reduces prolactin secretion when administered at high doses (Janssens, 1986; Jochle *et al*., 1989; Hammon *et al*., 1981). Ovariectomy is the only permanent preventive measure (Johnston, 1980; Jochle *et al*., 1989) if bitches are not intended for breeding.

Materials and Methods

Case history

The rottweiler bitch, four-year-old and fifty-kilogram body weight was presented at Jai Pet Care, private clinic at Raebareli with the history of maternal behavior like nesting and affection to inanimate objects, inappetance, licking of genitalia, yellow to redish white vaginal discharge oozing of milk from teat along with hypertrophy of mammary gland for 6 month.

Clinical Examination and Diagnosis

The bitch was dull and depressed with red yellow discharge from vagina. Blood test reveals that lower hemoglobin, higher TLC, SGOT, SGPT, and serum alkaline phosphatase as 11.8 g per cent, 16200/cmm, 378.7 U/L, 355.46 U/L, and 492.9 U/L respectively. On the basis of history, clinical observation and blood test, the case was diagnosed as pseudopregnancy and treated with tab cabergolin @ 5 µg per kg, orally, inj. Neohepatex 2 ml, im; inj. Conciplex 2ml,im; inj. Ceftiofur sodium 250mg, im for seven days afterward tab Bactrim DS 1, BD, PO; syp. Liv 52 ,5ml, OD, PO. For ten days.

Results and Discussion

The bitch was completely recovered approximately after three weeks. In this case antiprolactin therapy namely cabergolin given at recommended dose rate causes cessation of luteatrophic action of prolacti as a result luteolysis ensue. High TLC was suggestive of uterine infectin which was managed by antibiotic ceftiofur sodium. Moreover, high SGOT.SGPT and serum alkaline phosphatase was indicating compromised liver function. To cope up this Liv 52, neohepatex and conciplex was given accordingly. Thus, the conclusion was made that the clinical pseudopregnancy can be well managed by above mentioned therapeutic agents.

References

1. Allen WE. (1986). Pseudopregnancy in the bitch. The current view on aetiology and treatment. J Small Anim Pract; **27**:419- 424.

2. Arbeiter K, Brass W, Ballabio R, *et al.* (1988). Treatment of pseudopregnancy in the bitch with cabergoline, an ergoline derivative. J Small Anim Pract; **29**:781-788.

3. C. Gobello, P. W. Concannon and J. Verstegen (2001). Canine Pseudopregnancy: A Review. In: Recent Advances in Small Animal Reproduction, P. W. Concannon, G. England and J. Verstegen (Eds.) Publisher: International Veterinary Information Service (www.ivis.org), Ithaca, New York, USA.

4. Concannon, P. W. (1986): Canine physiology of reproduction. In: Burke T, ed. Small Animal Reproduction and Infertility. Philadelphia: Lea and Febiger; pp. 23-77.

5. Feldman EC, Nelson RW. (1987). Canine and Feline Endocrinology and Reproduction. Philadelphia: WB Saunders Co.

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 281-285

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 281-285
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of α-Tocopherol Acetate and Zinc Supplementation on Milk Composition in Crossbred Cows

Pankaj Kumar Maurya[1*], Anjali Aggarwal[2], P. K. Choudhary[1], A. K. Verma[1] and Pramod Kumar[1]

[1]College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP), India
[2]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001, Haryana, India
**Corresponding author*

Keywords

Milk composition, Somatic cell count, Transition period, α-tocopherol acetate, Zinc

A B S T R A C T

The study was conducted to investigate the effect of α-tocopherol acetate and zinc on milk composition in Karan Fries cows. Twenty pregnant Karan Fries cows were selected two months before expected date of calving. The experimental animals were randomly divided in to two groups namely control group (ten cows) and treatment group (ten cows). Treatment group cows were supplemented with α-tocopherol acetate @ 1000 IU/day/cow and zinc @ 60 ppm/day/cow. Milk fat % was lower in treatment group than control group but the overall fat in treatment group was found significantly higher than control group (4.47±0.20 vs. 3.95±0.27, P<0.01). The overall mean milk protein % was found 3.08±0.04 vs. 3.05±0.11, milk lactose % 4.47±0.08 vs. 4.48±0.10 and SNF % 8.17±0.15 vs. 8.15±0.17 in control group and treatment group, respectively which showed that there was no significant difference between the groups. The overall mean (±SEM) of somatic cell count of milk was found significantly lower (P<0.001) in treatment group than control group. The results of this study indicated that supplementations of antioxidants like α-tocopherol acetate and zinc have beneficial effects in improving quality of milk.

Introduction

For good quality dairy products there is need to know the quality aspects of milk produced. Since the diet is the fastest way to modify the milk production and quality in animals, even if the relations between the feeding and milk composition are quite complex. Trace elements, along with vitamins and minerals, are essential nutrients for cellular metabolism. They are critical components of almost every aspect of how a body grows, develops, functions and reproduces. Vitamin E is crucially involved in immune system function, such that supplementation with supranutritional levels of the vitamin E, results in improved immune responses and milk production (Chawla and Kaur, 2005; Baldi, 2005; Baldi *et al.*, 2008; Chandra and Aggarwal, 2009). There was significant decrease of somatic cell count (SCC) in milk at 15 days of lactation (0.29×10^6 vs. 0.86×10^6) in cows supplemented with 1000 IU vitamin E / day during dry period (Kaur *et al.*, 2002). The somatic cell count is internationally recognized as a parameter for assessing the milk quality and udder health. The present

COMPARATIVE EFFECTS OF CEFTIOFUR SODIUM, GENTAMICIN SULFATE AND *Zingiber officinale* ON HEMATOLOGICAL PARAMETERS OF ENDOMETRITIC BUFFALOES (*Bubalus bubalis*)

Pushkar Sharma[1], Sushant Shrivastava[2], Vijay Gautam[1], Rajesh Kumar[2*], Pramod Kumar[3] and Saurabh[1]
1 M.V.Sc. Scholar, Department of Veterinary Gynaecology and Obstetrics.
2 Department of Veterinary Gynaecology and Obstetrics.
3 Department of veterinary physiology and biochemistry
College of Veterinary Science & Animal Husbandry, Narendra Dev University of Agriculture & Technology, Faizabad-224229 (U.P) India.

Abstract
The present study aimed to investigate the comparative therapeutic efficacy of Ceftiofur sodium, Gentamicin sulfate and Zingiber officinale extract on hematological parameters of endometritic buffaloes. The endometritic affected animals were randomly allotted to five groups namely Groups CB, C, G, CF and GG comprising of ten animals in each group. Haemoglobin, PCV, TLC, DLC and ESR values were analysed at 0, 15th day and 30th day in each group. Haematological profile was differed significantly between cyclic and endometritic buffaloes. The findings indicated blood indices helps in diagnosis of clinical endometritis in buffaloes.
Keywords– *Endometritis, Ceftiofur sodium, Gentamicin sulphate, Zingiber officinale.*

Introduction

Endometritis is inflammation of the endometrial lining of the uterus and formation of mucopurulent secretion. It is a major cause of repeat breeder syndrome of bovines. Unlike metritis, it does not affect the general health. Therefore it has a major economic impact by poor conception rate, increasing calving interval, reduction in calf crop, increased cost of treatment decrease milk yield and increase cull rate. The most common initiating cause of endometritis is non-specific, opportunist pathogens that contaminate the uterus during the pericalving period, dystocia, retained foetal membranes (RFM), caesarian section, contamination of uterus at the time of A.I., induced parturition, still birth, twins, ovarian inactivity, cystic ovaries, unhygienic calving environment, concurrent disease and nutrition - fatty liver disease and hypocalcaemia are reported to increase endometritis rates, natural insemination infected with venereal disease, etc (Noakes *et al.*, 2002). Opportunistic pathogens are not able to colonize in the genital tract during normal circumstances due to several protective mechanisms, viz., anatomical and functional barriers, specific and nonspecific immune responses (Foldi *et al.*, 2006). Blood is a crucial importance for maintain of physiological equilibrium in the body. Normal levels of vital haematological constituents are of most importance for maintaining functional integrity of the reproductive system. Any change in haematological parameters may adversely affect the reproductive efficiency of livestock. Haematological indices are useful in diagnosing various pathological and metabolic disorders, which can adversely affect the production and reproductive performance of buffaloes.

Materials and methods

In these study mainly two commonly used antibiotics ceftiofur sodium and gentamicin sulphate and one herb extract, *Zingiber officinale* were selected for treatment of endometritic buffaloes. The cases of Instructional Dairy Farm Complex, Teaching Veterinary Clinical Complex, Veterinary hospitals lying adjacent to Kumarganj, Faizabad, and cattle colonies near Buddeyshwaran, lucknow (U.P) India were selected for study purpose. *Zingiber officinale* extract was prepared in Soxhlet apparatus as per standard method and then concentrated in vacuum rotary evaporator at 40^0 C for ethanol removal. One gram concentrated extract was mixed in double distilled water in floor shaker water bath used for intrauterine therapy.

The buffaloes were categorized into five groups for the present study, viz., Normal cycling healthy estrus buffaloes (**CB**), No treatment is given, recommended for sexual rest (**C**), 10ml (40mg/ml) Gentamicin sulfate (dissolved in 40 ml of distilled water) intrauterine daily for three days(**G**), 500mg Ceftiour Sodium (dissolved in 50 ml of distilled water) intrauterine daily for three days.(**CF**), One gram Extract of *Zingiber officinale* (dissolved in 50 ml of distilled water) intrauterine daily for three days (**GG**). Blood Sample was collected three times (0, 15th and 30th day) during the whole experimental period. Approximately 5 ml of blood was collected aseptically from the jugular vein of each experimental animal in sterilized disposable syringe (16 gauge needle). All haematological values obtained were subjected suitable statistical methods (Snedecor and Cochral, 1989).

Results and Discussion

In the present research work, blood indices such as Hb, PCV, TEC, TLC and DLC were estimated to investigate any possible correlation in between endometritis and hematological profile of buffaloes.

Hemoglobin (Hb)

The overall mean hemoglobin in pretreated, 15th, 30th day post treated and in regular cyclic buffaloes were given in the table 3.1. and column chart 3.1. Hemoglobin levels were increased significantly ($P<0.05$) in gentamicin (G) and ceftiofur (CF) after 30th day post treatment. Pateria and Rawal (1990) and Pateria *et al.*, (1992) also observed significant increase ($p<0.05$) in haemoglobin level after treatment in buffaloes which were affected with metritis and endometritis. The decrease in haemoglobin level of affected buffaloes is probably due to disintegration of erythrocytes and/ or effect of some haemolytic type of microbes and their endotoxins on the blood cells and haemopoietic system. Similar results were obtained by Dhoble and Gupta (1981), Jaini *et al.*, (1995), Ahmad *et al.*, (2003), Rathour *et al.*, (2005) and Narnaware and Sirothia (2010) in buffaloes. The mean Hb levels in responded animals was lower at the time of treatment and increased significantly ($p<0.01$) after 21 days in next estrus. Pradhan *et al.*, (1995) reported that lower level of Hb values which may be representing some systemic derangement due to deficiency of certain trace minerals which in turn depressed the physiology of reproduction. The low level of Hb indicated long term protein deficiency and influences tissue oxygenation of reproductive tract which in turn affects the cyclicity (Ramakrishna, 1997). Lack of sufficient quantities of Hb in blood is responsible for reduced oxygen transport to the vital tissues, it causes reduced oxidation of nutrients, which in turn affect the whole cellular metabolism in gonadal cells which is metabolically more active. (Sabasthin *et al.*, (2012) reported that decrease in the Hb value in the animal could be the cause of repeat breeding. The trend of variation in PCV was found to be similar to be the value of Hb and ESR in both cattle & buffaloes. Similar finding was also reported by Anthony *et al.*, (2012) and Verma (2015).

Packed Cell Volume (PCV)

The mean value of PCV in regular cyclic buffaloes group (CB) was observed as 30.89±0.31% PCV values were reported as 29.22±0.27, 28.69±0.28 & 9.21±0.22 per cent in untreated control, 29.05±0.36, 29.75±0.52 & 29.75±0.52 per cent in gentamicin, 28.18±0.29, 30.54±0.46 & 31.07±0.40 per cent in ceftiofur (CF) groups and 29.03±0.42, 29.63±0.45 & 30.19±0.25 percentage in *Zingiber officinale* extract at 0, 15th and 30th day post treatment, respectively (Table No. 3.1 and column chart 3.2). Significant ($p<0.01$) increase in PCV was observed in all the treatments at 30th day post treatment. This indicates that the mean PCV increases after treatment by using any biological modifier which reduces the infection. The present

RESEARCH ARTICLE

Influence of Different Therapy on Hematological Markers and Fertility Response in Anestrus Sahiwal Cows

Safayat Husain[1], Rajesh Kumar[1]*, Bhoopendra Singh[1], Sushant Srivastava[1], Rabindra Kumar[1], Pramod Kumar[2], Ashish Srivastava[3]

Abstract

The study was designed to evaluate influence of different therapy on hematological markers, resumption of ovarian cyclicity and conception rate in 24 anestrus Sahiwal cows, which were randomly and equally allocated to four groups as G1, G2, G3 and G4. Lugols iodine (2%, cervical painting with per rectal massage of genitalia thrice on alternate day) XXX herbal bolus (1 bid for 2 days, repeated on day 11 & 12 later in non-respondents) and modified ovsynch protocol (progesterone 100 mg s/c once a day for 6 days followed by GPG) was administered in G1, G2 and G3, respectively, while G4 kept as untreated control. All these animals were dewormed with bolus fenbendazole 3 g plus ivermectin 100 mg, once and supplemented with mineral mixture 30 g/day for 21 days before above therapies. Blood samples were collected thrice, *i.e.*, on day 0, day of induced estrus/AI and day 21 post-AI (day 0, 21 and 63 in non-respondents) for hematological analysis. In general, hemogram and leucogram did not vary significantly within and among different groups, except neutrophil and lymphocyte. Cent per cent estrus induction response was observed in treatment group G1, G2 and G3, however, none of the cows resumed cyclicity in untreated control group G4. The treatment to estrus induction interval was 9.17±2.34, 8.33±2.36 and 16±0.00 days; treatment to fertile estrus interval was 33.6±8.40, 42.0±8.57 and 29.4±5.14 days and overall conception rate was 83.33, 66.66 and 83.33 % in group G1, G2 and G3, respectively, while nil in untreated anestrus cows.

Keywords: Anestrus, Conception, Estrus induction, Sahiwal cows, Therapy.

Ind J Vet Sci and Biotech (2020): 10.21887/ijvsbt.16.(2,3,&4).17

Introduction

Bovine anestrus syndrome is a most common single cause of infertility in dairy cattle that leads to huge economic losses in terms of prolonged calving interval, reduced calf crop and shorter productive life. Malnutrition is the most common cause of true anestrus featured by absence of estrus cyclicity with small smooth inactive ovaries. Bovine anestrus syndrome is a multifactorial disorder of the reproductive cycle which is characterized by absence of estrus signs manifested either due to lack of expression of estrus or failure of its detection. It can be normal physiological (pregnancy, lactation and in early postpartum period) or pathological (metritis, fetal resorption/PCL, pyometra, maceration and mummification). Many non-hormonal and hormonal drugs have been used to treat anestrus (Kumar *et al.*, 2011; Dhami *et al.*, 2015; Dhami *et al.*, 2019; Kumar *et al.*, 2020[a]). Among herbal therapeutics, various type of tropical plants are used traditionally to augment the reproductive performance. Some plants contain secondary metabolites which are effective in inducing estrus in postpartum anestrus cows (Pugashetti *et al.*, 2009). Deficiency of minerals is also an important cause of anestrus in animals (Kumar *et al.*, 2020[b]). This study was therefore designed to assess influence of different treatment protocols on hematological markers as well as on fertility response in true anestrus Sahiwal cows.

[1]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[2]Department of Veterinary Physiology & Biochemistry, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[3]Department of Instructional Livestock Farm complex, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India, e-mail: drrajesh25@gmail.com

How to cite this article: Husain, S., Kumar, R., Singh, B., Srivastava, S., Kumar, R., Kumar, P., & Srivastava, A. (2020). Influence of Different Therapy on Hematological Markers and Fertility Response in Anestrus Sahiwal Cows. Ind J Vet Sci and Biotech, 16(2,3,&4): 76-80.

Source of support: Nil

Conflict of interest: None.

Submitted: 25/07/2020 **Accepted:** 30/11/2020 **Published:** 25/12/2020

Materials and Methods

Selection of Experimental Animals

The study was carried out under farm conditions during the year 2019-20 in the semi-urban areas of Ayodhya district in

© The Author(s). 2020 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

RESEARCH ARTICLE

Effect of Exogenous Melatonin and Different Photoperiods on Differential Leucocyte Count in Chhotanagpuri Ewe

Pankaj K. Choudhary[1]*, Ajay K. Ishwar[2], Pramod Kumar[1], Pankaj K. Maurya[1], Mukesh Kumar[3], Rajesh Kumar[4], Debasish Niyogi[5]

Abstract

Forty-two healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging from 14.11 ± 0.09 to 15.38 ± 0.06 kg, were selected and isolated from rams 2 months before melatonin administration. The selected animals were allocated randomly into seven groups each of 6 animals, *viz.*, Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + melatonin administration 3 mg/day orally], Group-IV [(LD + melatonin administration s/c @ 1 mg/day], Group-V [Short day (SD) control], Group-VI [SD + melatonin administration 3 mg/day orally] and Group-VII [SD + melatonin administration s/c @ 1 mg/day]. Rams were then introduced into each group after completion of exogenous administration of melatonin for one month. Blood samples without anticoagulant were collected from each animal a day before the experiment and then every month till the fifth month. Among different periods, lymphocyte % in the third and fourth months of the experiment was significantly ($p < 0.05$) lower in all groups (group-I to VII) in comparison to 0 days, first, and second months. In the fifth month, lymphocyte % was significantly ($p < 0.05$) higher in group III, IV, VI, and VII compared to the third and fourth months of the experiment. Neutrophil % in the third and fourth months of the experiment was significantly ($p < 0.05$) higher in all groups in comparison to 0 days, first, and second months. In the fifth month, neutrophil % was significantly ($p < 0.05$) lower in group III and VI than in the third and fourth months. Monocyte % was significantly ($p < 0.05$) higher in group III and IV than group VII at first month. In the third month, monocyte % was significantly ($p < 0.05$) higher in group IV and VI than in group I and group II.

Keywords: Chhotanagpuri Ewe, Differential leucocyte count, Exogenous Melatonin, Photoperiod.

Ind J Vet Sci and Biotech (2021): 10.21887/ijvsbt.17.2.00

Introduction

The major functions of the white blood cells and their differentials are to fight infections, defend the body by phagocytosis against invasion by foreign organisms, and produce or at least transport and distribute antibodies in immune response (Etim, 2015). Thus, animals with low white blood cells are exposed to a high risk of infection. In contrast, those with high counts are capable of generating antibodies in the process of phagocytosis and have a high degree of resistance to disease (Soetan *et al.*, 2013) and enhancing adaptability to local environment and disease prevalent conditions (Isaac *et al.*, 2013). According to Etim *et al.* (2014) immune status is a function of leucocytes, lymphocytes, and neutrophils. Lymphocytes are known to play critical roles in the immune defense system of both men and animals (Etim *et al.*, 2014[b]).

Melatonin signaling is necessary for photoperiodic adjustment in immune responses; it is difficult to parse the direct differential effects of melatonin on immune cells from indirect modulatory actions on other neuroendocrine axes, including the systems that control gonadal and adrenal steroids. However, the hypothesis that melatonin acts on immune function via downstream hormonal effects has not been born out, as gonadectomy and steroid replacement has minimal effect on photoperiodic plasticity in the immune system (Prendergast *et al.*, 2005).

Exogenous melatonin administration increased the total leucocytic count and lymphocyte percentage in squirrels (Rai

[1]Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[2]Department of Veterinary Physiology, Ranchi Veterinary College, Birsa Agricultural University, Ranchi-834006, Jharkhand, India.

[3]Department of Veterinary Anatomy and Histology, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[4]Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

[5]Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India.

Corresponding Author: Pankaj K. Choudhary, Department of Veterinary Physiology and Biochemistry, College of Veterinary Science and Animal Husbandry, University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India., e-mail: drpankajvet2003@gmail.com

How to cite this article: Choudhary, P.K., Ishwar, A.K., Kumar, P., Maurya, P.K., Kumar, M., Kumar, R., & Niyogi, D. (2021). Effect of Exogenous Melatonin and Different Photoperiods on Differential Leucocyte Count in Chhotanagpuri Ewe. Ind J Vet Sci and Biotech, 17(2): 1-5.

Source of support: Nil

Conflict of interest: None.

Submitted: 00/00/2021 **Accepted:** 00/00/2021 **Published:** 00/00/2021

© The Author(s). 2021 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 1076-1079

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP1: 1076-1079

Pramod Kumar
Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rishikant
Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Rabindra Kumar
Department Of Veterinary Obst. & Gynae. C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

KN Singh
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Mukesh Kumar
Department of Veterinary Anatomy C.V. Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

Correspondence
Pramod Kumar
Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP, India

A review: heat stress in cow and buffaloes in India

Pramod Kumar, Rishikant, Rabindra Kumar, KN Singh and Mukesh Kumar

Abstract
India is a tropical climatic country in which heat stress is an important disadvantageous factor that reduces the production performance of cattle and buffalo and conduces to significant decrease in milk yields in dairy cows and buffalo and some metabolically disorders. The objective of this review is to known the heat stress metabolism, its causing factors and its preventative methods for increase the production performance through manage mental and nutritional procedures.

Keywords: Tropical, Heat, Temperature, Conduction, Convection, Radiation, Evaporation, Panting, Sweating, Moisture

Introduction
Climatic conditions of India are such that the hot and humid season is relatively long, there is intense radiant energy for an extended period, and there is generally the presence of high relative humidity. Thus, heat stress is chronic in nature especially for animal, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance of animal. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy (West, 2003) [20]. Heat production and accumulation, coupled with compromised cooling capability because of environmental conditions, causes heat strain in the cattle and buffaloes to increase to the point that body temperature rises, intake declines and ultimately the cow's productivity declines.

Heat stress is caused by a combination of climatic factors like air temperature, humidity, solar radiation, wind velocity etc. A common time for experience adverse effects of high temperatures is during transport (Fiore *et al*, 2009) [6]. Transport is a multi affected stressor that can create or exacerbate existing heat loads. Handling of animal, increases body temperature. Animal are adversely affected any time the ambient temperature is more than their thermoneutral zone, which ranges about 25°C. Because that heat stress conduces to some disadvantageous affect on livestock, many researchers work about heat stress in animal.

Thermoneutral zone
The Thermoneutral Zone (TNZ) is defined as. "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non evaporative physical processes alone" (Bligh & Johnson, 1973) [3]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal (Silanikove, 2000) [14]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation or acclimatization, level of productivity, housing conditions, insulation, and behavior etc (Yousef, 1985b) [22]. In order to more clearly define the TNZ (Silanikove, 2000) [14] suggested that the subdivision of the TNZ into a zone of thermal well-being is most suitable to describe the relation between an animal and its environment. Figure 1, illustrate this concept.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(6): 1220-1221
© 2019 JEZS
Received: 19-09-2019
Accepted: 21-10-2019

Sandeep Yadav
M.V.Sc. Scholar, Department of Veterinary Medicine, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Vibha Yadav
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology& Biochemistry, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Corresponding Author:
RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Sciences and A.H A.N.D.U.A.T., University, Kumarganj, Ayodhya, Uttar Pradesh, India

Management of traumatic proptosis in a pug: A case study

Sandeep Yadav, Vibha Yadav, RP Diwakar and Pramod Kumar

Abstract
A three years old male pug dog, weigh 10 kg was presented to Jai Pet Care Clinic Raebareli, Uttar Pradesh for treatment with unilateral traumatic proptosis. All clinical parameters were normal. Physical examination revealed partial prolapse of right eye globe with severe periorbital edema, haemorrhage, absence of menace and presence of miosis. Therapeutic management done by administration of triflupromazine @4mg/kg I/M for sedation, dexamethasone and gentamicine 0.2ml each in combination injected through intra palpebral route, which was repeated on 5th day. Animal was also given intramuscular injection of gentamicin @5mg/kg, dexamethasone @0.125mg/kg, vitamine B complex 2.0 ml and chlorpheniramine maleate @0.5mg/kg only once for 5 consecutive days. Eye drop of moxifloxacine and dexamethasone 4 times a day for instillation, chloramphenicol ointment 4 times a day for local application and enrofloxacin @5mg/kg orally once for 7 days were used. Animal recovered successfully after 7 days of regular treatment. Vision was assessed by simple vision testing using junction box, after 15 days of recovery and found normal.

Keywords: Pug, proptosis, therapeutic management

Introduction
Proptosis is forward displacement of globe which occur secondary to any blunt trauma to head [7]. Proptosis typically occurs in dogs following trauma to the face or head. Certain breeds of dog are more prone to eye proptosis than others because of their differences in facial conformation. The most common cause of proptosis in small breed dogs is a fight with a larger dog. During trauma, the globe is luxated from the orbit, and eyelid spasms prevent its retraction. Secondary orbital hemorrhage and swelling displace the globe further from the orbit following corneo-conjunctival drying and malacia [3]. Prognosis depends on pupil size and reflexes, duration of exposure, other globe or orbital damage, breed and other systemic trauma. Approximately 40–60% of dogs, but very few cats, recover vision. Traumatic proptosis can occur in any breed and in both dogs and cats. Only 20-40% of dogs that have the reattachment of the eyeball regain their vision.

Case history and observations
A three year old male pug of 10 kg weight was presented at Jai Pet Care Clinic Raebareli, Utter Pradesh with unilateral traumatic proptosis having recent history of blunt head trauma by hitting head against the wall. Clinical examination revealed partial prolapse of right eye globe (fig.-1) through the pulpebral fissure with severe periorbital edema (fig.-2), haemorrhage without fracture of skull. There was absence of menace and presence of miosis. Corneal examination revealed concurrent finding of pigmentary vascular keratitis. All clinical parameters of the pug were normal.

Fig 1: Unilateral partial proptosed globe in a pug

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 273-280

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 273-280
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Exogenous Melatonin and Different photoperiods on Serum Glucose and Total Serum Protein levels in Chhotanagpuri Ewe.

P. K. Choudhary[1*], A. K. Ishwar[2], Bablee Jyoti[3], R. Kumar[4], D. Niyogi[5], M. Kumar[6], P. Kumar[1] and P. K. Maurya[1]

[1]Department of Veterinary Physiology and Biochemistry, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[2]Department of Veterinary Physiology, R.V.C., B.A.U., Ranchi, India
[3]Department of Chemistry, L.N.M.U., Darbhanga, India
[4]Department of Agronomy (A.H.), B.A.U., Sabour, Bhagalpur, India
[5]Department of Veterinary Pathology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
[6]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D. University of Agriculture and Technology, Kumarganj, Faizabad, U.P., India
**Corresponding author*

Keywords

Chhotanagpuri ewe, Exogenous melatonin, Photoperiod, Serum glucose, Total serum protein

ABSTRACT

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. After administration of melatonin, serum glucose was decreased in group- III, IV, VI and VII in comparison to group-I, although this decrease was not statistically significant. An increasing trend of serum glucose was observed in all groups from third to fourth month. Total protein at first month was significantly ($P<0.05$) higher in group VI in comparison to 0 day. After administration of melatonin, total serum protein concentration was significantly ($P<0.05$) decreased in group VI in comparison to first month and continued up to third month. At fifth month, total serum protein was significantly ($P<0.05$) lower in group III, IV and VI in comparison to 0 day and first month.

Introduction

Sheep husbandry is backbone of rural economy in India. The Chhotanagpuri sheep is the only recognized breed of sheep found in Jharkhand with a few numbers in Bihar and West Bengal. This breed is maintained solely for mutton production. They produce coarse wool of poor quality. This is being utilized for carpet manufacturing. Sheep

EFFECT OF A-TOCOPHEROL ACETATE AND ZINC SUPPLEMENTATION ON LEPTIN HORMONE DURING DRY PERIOD AND EARLY LACTATION IN CROSS BRED COWS

Pankaj Kumar Maurya*, Anjali Aggarwal[1], Pramod Kumar and P.K. Choudhary
College of Veterinary Sci. & A.H., N.D. University of Agriculture & Technology, Kumarganj, Faizabad (UP)
[1]Dairy Cattle Physiology Division, National Dairy Research Institute, Karnal-132001 (Haryana)

Abstract

The study was conducted to investigate the effect of α-tocopherol acetate and zinc supplementation on Leptin Hormone during dry period and early lactation in cross bred cows. Twenty pregnant Karan Fries cows were selected on the basis of their body weight, BCS and parity: ten cows were kept in control group and other ten cows in treatment group which were supplemented with 1000 IU α-tocopherol acetate and 60 ppm zinc per day per cow. Blood samples were collected on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45, +60 with respect to expected date of calving. Plasma was analyzed for Leptin hormone. Body condition score of all the experimental animals was recorded on the day of blood collection. At parturition, BCS decreased significantly ($P<0.01$) in control group than treatment group. The plasma concentration of leptin was decreased at parturition and the level was significantly ($P<0.001$) higher in treatment group as compared to control group (3.66 vs. 2.55 ng/ml). Plasma NEFA was significantly ($P<0.001$) lower in treatment group as compared to control group. The results of this study indicated that supplementation of α-tocopherol acetate and zinc have beneficial effects in changing Leptin hormone level in this way that improves body condition and metabolic status of the animals.

Keywords: *Leptin, Body Condition Score, Energy Metabolites, α-tocopherol acetate, Zinc*

Introduction

Leptin is a 16 kDa protein hormone and it is synthesized by white adipose tissue. Leptin is involved in regulation of feed intake, energy balance, immunity and reproduction (Houseknecht *et al.*, 2000; Ahima and Flier, 2003). After parturition, dairy cows suffer from an intense energy deficit caused by the onset of copious milk secretion and an inadequate increase in voluntary food intake which contributes to a decline in plasma leptin. This decline mirrors that of plasma insulin but is reciprocal to the profile of plasma growth hormone (GH), suggesting that both hormones may regulate plasma leptin in periparturient dairy cows (Block *et al.*, 2001). Energy deficit of early lactation reduces leptin synthesis in white adipose tissue (WAT), and suggest roles for insulin, GH and metabolic fuels in mediating this effect of energy balance (Block *et al.*, 2001). A concomitant suppression of immune functions and metabolic disorders during early lactation are related to decreased fertility (Butler and Smith, 1989). This may partly be due to decrease in blood concentrations of vitamins A & E and Zn (Meglia *et al.*, 2001, Chandra, 2009). To meet the nutritional demands of milk synthesis during early lactation, dairy cows need to mobilize body reserves causing negative energy balance until nutrient intake covers the demands.

Material and methods

Experimental design

The study was conducted at the Cattle Yard of National Dairy Research Institute, Karnal, Haryana (India). For the present study 20 Karan Fries (KF) peripartum cows were selected from the herd of National Dairy Research Institute, Karnal, 10 cows kept in Control group and other 10 cows in Treatment group. The cows in the control group were supplemented with no vitamins, and in the treatment group, they were given 1,000 IU of α-tocopherol acetate and 60 ppm zinc per cow per day from 60 days prepartum to 60 days postpartum over and above the normal feeding schedule at dairy farm of NDRI.

Blood sampling

Blood samples (10 ml/cow) were collected in the morning (6:00 AM) before feeding in sterile heparinised vacutainer tubes (BD VacutainerTM, UK) from jugular vein puncture, posing minimum disturbance to animal, on the days -60, -45, -30, -15, -7, 0, +7, +15, +30, +45 and +60 with respect to expected date of calving. Day '0' represented the day of calving. Blood samples were brought to the laboratory in the icebox soon after collection and centrifuged at 3000 rpm at 4°C for 20 min to separate the plasma. Plasma samples were stored at -20°C until analysis of Leptin hormone. Body condition score (BCS) of all the experimental animals was recorded on the day of blood collection using a scale of 1 to 5.

Sample analysis

Blood sample was analyzed for plasma leptin and NEFA. Plasma Leptin was determined by "Bovine Leptin ELISA Quantitation kit" from Cusabio Biotech Co., Ltd. The copper soap solvent extraction method modified by Shipe et al. (1980) was adopted for the estimation of plasma NEFA.

Statistical analysis

Statistical analysis of data was carried out to find the mean ± SE. Two way ANOVA was done to find significant difference between groups and days of experiment and their interaction by using SYSTAT 3.1 (2004) software. The correlations among the various parameters were also calculated (Snedecor and Cochran, 1994).

Results and Discussion

Leptin

The mean±SE of plasma leptin concentration of control cows was 6.06±0.10 ng/ml 60 days before calving and on the day of calving it decreased to 2.55±0.31ng/ml. Further, in treatment group the plasma leptin concentration was 6.19±0.11ng/ml 60 days before calving and on the day of calving it decreased to 3.66±0.11ng/ml. In present study decrease in the plasma leptin concentration of control and treatment group cows was 57.92% and 40.87% respectively from 60 days before calving to the day of calving. This decrease was more significant ($P<0.01$) from 30 days before calving to the day of calving in control group than treatment group. After parturition it's level remained low up to 30 days then started increasing up to 60 days of lactation.

In present study there was found a positive correlation between leptin with BCS and insulin and a negative correlation was found between leptin with NEFA in control and treatment group of cows around parturition. The plasma concentration of leptin was positively correlated with plasma concentrations of insulin and negatively correlated with plasma concentrations of growth hormone, cortisol and non-esterified fatty acids (Block *et al.*, 2001; Chelikani *et al.*, 2008). Sauerwein *et al.* (2004) investigated that in ruminants the decline in plasma leptin levels towards parturition is probably caused by the decline in adiposity and insulin concentrations. In ruminants and other animals, leptin is synthesized in proportion to the overall degree of adiposity and acts on the central nervous system to reduce voluntary feed intake (Ehrhardt *et al.*, 2000). Leptin, mainly produced in adipose tissue, inhibits feed intake and down-regulates adipose tissue deposition. Block *et al.* (2001) showed that leptin is negatively correlated with the amount of nonesterified fatty acids, which reflects the amount of fat mobilization. From early to mid pregnancy circulating leptin levels increased and remained elevated until late pregnancy in cattle (Liefers *et al.*, 2003; Villalobos *et al.*, 2007).

Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 292-298

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7692 Special Issue-7 pp. 292-298
Journal homepage: http://www.ijcmas.com

Original Research Article

Evaluation and Comparison of Heat Stress Indices for Cattle and Buffaloes

Pramod Kumar[1*], R. C. Upadyay[2], Rabindra Kumar[3], P. K. Chaudhary[1], P. K. Maurya[1], Rajesh kumar[3], Vibha Yadav[4] and Mukesh Kumar[5]

[1]Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[2]Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana-130001, India
[3]Department of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[4]Department of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
[5]Department of Veterinary Anatomy C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229, India
**Corresponding author*

A B S T R A C T

Cattle and buffaloes experience different level of stress during summer and hot humid conditions. However, the assessment of the heat stress and the translation of the heat stress in terms of physiological and psychological strain is complex. For over a century attempts have been made to construct an index, which will describe heat stress satisfactorily. The many indices that have been suggested can be categorized into two groups: "*physiological indices*" and "*environmental*", or "*direct indices*". The first groups are sophisticated indices, which are based on physiological variables; they are difficult to calculate and are not feasible for daily use. The latter group comprises of simple indices, which are based on the measurement of basic environmental variables. In this group many indices are in use for over four decades: the "temperature humidity index" (THI) and the "*TGWB Index*". The following research on heat stress indices and their comparison and evaluation to animal production and their performance. With the present knowledge it is suggested to adopt the TGWB Index under tropical conditions is recommended because globe temperature takes into accounts Tdb and solar radiant heat exchange and can help in finding stress level.

Keywords

Heat stress, Environmental variables, Heat stress indices, TGWB Index, THI

Introduction

In India during summer cattle and buffaloes are exposed to severe environmental heat stress, which may deteriorate productivity and performance of animals may even threaten to their survival. Thus, it is expected that the physiological heat strain experienced by an animal will be related to the total heat stress to which they are exposed, serving the need to maintain body-ore temperature within a relatively narrow range of temperatures. Many attempts have been made to estimate the stress inflicted by a wide range of climate, or to estimate the corresponding physiological strain and to combine them into a single index—a heat stress index. The difficulties in creating a universal heat stress index are outlined in the present research and a simple way to

Global Veterinaria 22 (5): 267-272 2020
ISSN 1992-6197
© IDOSI Publications, 2020
DOI: 10.5829/idosi.gv.2020.267.272

The Saga of Macrominerals and its Role in Reproduction in Domestic Animals: A Review

[1]Rajesh Kumar, [2]R.P. Diwakar, [3]H.C. Verma, [4]Anand Kumar, [5]Pramod Kumar, [6]K.D. Singh and [2]Vibha Yadav

[1]Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India
[2]Department of Veterinary Microbiology, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[3]Department of Veterinary & Animal Husbandry Extension Education, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[4]Department of Veterinary Gynaecology & Obstetrics, Ranchi Veterinary College, B.A.U., Kanke, Ranchi-06, Jharkhand, India
[5]Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India
[6]Department of ILFC, C.V.Sc. & A.H. and UAT, Ayodhya, UP, India

Abstract: A number of inorganic elements are essential for the growth, production and reproduction of animals. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Key words: Domestic Animals · Macrominerals · Production · Reproduction

INTRODUCTION

A number of inorganic elements are essential for the growth, production and reproduction of animals [1]. In addition, mineral requirements are also influenced by age, parity, stage of pregnancy and stage of lactation. The inorganic elements are classified according to their requirements in animal body. Those required in greater quantities are referred as macrominerals (calcium, phosphorus, sodium, chloride, potassium, magnesium and sulfur). Macrominerals required in large amount each day and their concentration in diet is expressed as percentage of diet or in grams per kilogram of diet. Macrominerals has role in different physiological functions. Other elements required in much smaller amounts are referred as trace minerals (microminerals) i.e. copper, cobalt, iodine, iron, manganese, molybdenum, selenium, zinc, chromium and fluorine. Their concentration in diet is expressed as parts per million (ppm), which is equivalent to milligram per kilogram of diet or in some cases as parts per billion (ppb), which is equivalent to microgram per kilogram of diet. Adequate quantity of minerals are utmost important for proper functioning of various physiological functions in animals. Deficiency and excess both have detrimental effects on production and reproduction; thus significantly affecting the economics of animal husbandry.

Role of Various Macro Minerals in Animal Reproduction

Calcium (Ca): Calcium is an essential component of skeleton and plays a pivotal role in maintaining homeostasis of vertebrates [2]. The maximum portion of calcium present in the bone as hydroxyapatite (99%) and small fractions present in the cell membrane or endoplasmic reticulum (0.9%), extracellular fluid or serum (0.1%) and in cytosol (0.00002%) [3]. Extracellular calcium exist in three forms i.e. ionized (50%), complexes to anions (5%) such as citrate, bicarbonate, phosphate, or lactate and protein bound (45%). Ionized calcium involved in array of physiological processes such as muscular

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, C.V.Sc. & A.H. and Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, UP, India.

SELECTING A SUITABLE HEAT STRESS INDEX TO PROTECT CATTLE AND BUFFALOES IN HOT AND HUMID CLIMATE

Pramod Kumar[1] *, R. C. Upadyay[2], P.K.Maurya[1], P.K. Chaudhary[1], Nilufar Haque[3], Rajesh Kumar[4], Rabindra Kumar[4] and R.P.Diwakar[5]

[1] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[2].HOD (Ret), Division of Dairy Cattle Physiology, NDRI, Karnal, Haryana, 130001
[3] Department of Veterinary Physiology & Biochemistry, C.V.Sc. & A.H., SDAU, Dantiwada, Gujarat-385506
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An assessment of any climate conditions requires extensive measurements to be health and production performance of animal in the climatic zone. This can be labour-intensive, time-consuming and consequently impractical for daily production and comfort assessments of the animals. Therefore, a simple indicator like a heat stress index is needed to enable a quick, valid and acceptable evaluation of animal climatic conditions on a regular basis. This can be explained by the unending quest to develop a "universal index," which has led to the proliferation of many proposed heat stress indices. In this research study is to discuss the selecting a suitable heat stress index for thermal planning and management purposes in hot and humid climatic zone for dairy industries. A method is proposed a defined strategy for selecting and recommending heat stress indices to be used in a particular climatic zone and worldwide based on a heat stress index. The performance of different heat stress indices used in dairy industries and other cattle farm varies based on the climatic conditions and the level of activities. Therefore, carefully selecting or establishing a suitable heat stress index is of paramount importance to ensure the comfort, health and increasing productivity of the cattle and buffaloes. These methods assess and select the most appropriate index for hot and humid climatic conditions to protect the cattle and buffaloes from thermal stress. Although complex, the method presents results that are easy to interpret and understand than any other methods.

Keywords: climatic zone, heat stress index, thermal stress, dairy industries.

Introduction

Heat stress is chronic in nature, there is often little relief from the heat during the evening hours, and intense bursts of combined heat and humidity further depress performance. Lactating dairy cattle and buffaloes create a large quantity of metabolic heat and accumulate additional heat from radiant energy [1]. The ability of many indices using these elements have been developed in past; but their utility remained limited. Majority of studies on thermal stress in livestock have used temperature-humidity index (THI). THI represent the combined effect of air temperature and humidity with level of heat stress. Milk yield and DMI exhibited significant declines when maximum THI reached 77. Later research determined that the critical values for minimum, mean, and maximum THI were 64, 72 and 76 respectively [2]. In addition, a climate change scenario was constructed by raising both the minimum and maximum temperatures by 2.76°C, which is a mid-range temperature change for approximate doubling of atmospheric greenhouse gas concentrations. The incidence of stress days as measured by THI greater than 80 has increased significantly over the 40-year period (60%) and the climate change scenarios suggested further, substantial increases (138%) in the frequency of such heat stress days. In addition, in the climate change scenario there was a very marked increase in days where animals could no longer thermo regulate by sweating alone [3]. Different animal species have different sensitivities to air temperature, humidity, solar radiation and wind velocity etc. Cattle and buffaloes have differences in their heat tolerant capacity. Cattle can tolerate high temperatures at low air humidity than buffaloes. This is due to the fact that, cattle can dissipate heat more efficiently by surface evaporation whereas buffaloes use surface evaporation for body cooling to a limited extent.

This research study posed the question of which index can be recommended for a hot and humid climate? In this paper, a method is used to compare a thermal comfort model with some of the most widely used heat indices in dairy industries and another cattle farm. The method is applied to predict the "comfort zone" and to recommend an index based on its production performance as close as possible to the "comfort zone." The comparative analysis uses comfort data including air temperature, airflow velocity, humidity and estimated physiological parameters such as respiration rate and rectal temperature.

Cattle and buffaloes have capacity to maintain their body temperature with in a precise limit even after exposure of environmental extremes [4]. Animals gain heat from three sources: chemical, mechanical and thermal. Chemical and mechanical heat transfer relates to metabolic processes and represents the body's main heat sources. The influence of the thermal environment on an animal is primarily exerted through energy exchanges involving convection, conduction, radiation and evaporation [5]. There are mechanisms by which the body can regulate its core temperature both at rest and during activity, and in both hot and cold or humid environments, along with health risks that are associated with physical activity in the aforesaid environments [6]. Assessment of "Thermoneutral Zone" must start with the maximum production with wellbeing of animal. It is extremely difficult to classify the many factors that affect thermal comfort. The interaction between the physical demands imposed upon an animal his physiological status, and his psychological attitudes. Because thermal comfort is rather subjective and restrictive, it is better to define a Thermoneutral Zone within which most animals will be comfortable. This necessitates the need to define a "zone" in which most of the animals will consider comfortable, the so-called comfort zone. This comfort zone will be ascribed using the climatic and physiological parameters of the environment and some existing thermal comfort models.

The Thermoneutral Zone (TNZ) is defined as "the range of ambient temperature within which metabolic rate is at a minimum, and within which temperature regulation is achieved by non-evaporative physical processes alone [7]. The lower critical ambient temperature range point and the upper critical ambient temperature point indicate the limits of the TNZ. The ambient temperature below, which the rate of heat production of a resting homeotherm increases to maintain thermal balance, is the lower critical temperature (LCT). The upper critical temperature (UCT) may be defined as the ambient temperature when the: (a) metabolic rate increases; (b) evaporative heat loss increases; or (c) tissue thermal insulation is minimal [8]. Below and above these temperature limits heat production is increased. The width of the thermoneutral zone will vary depending on age, species and breed, level of nutrition, previous state of temperature acclimation

The idea of the thermal index goes back to 18th century [9]. Without considering the dry-bulb temperature, perhaps the first published heat stress index was the wet-bulb temperature proposed by Haldane [10]. Since then a large number of heat stress indices have been proposed.

GROSS AND HISTOLOGICAL STUDIES OF THE URETER IN *MARWARI* SHEEP (*Ovis aries*)

Krishna Nand Singh[1], Sanjeev Joshi [2], Rakesh Mathur[2], Mukesh Kumar[1], Pramod Kumar[1], S.S. Sengar[1] K. K. Tripathi[1] and Rakesh Gupta[3]

1. Asstt. Professor, C. V. Sc & A.H., N.D.U.A & T., Kumarganj- Faizabad (U.P.)
2. Department of Veterinary Anatomy and Histology, CVAS, Bikaner.
3. P.G. scholar Department of Veterinary Pathology, C. V. Sc & A.H., N.D.U.A & T.

Abstract

The present study was conducted on ureters of 15 *Marwari* sheep of either sex between the ages of 1.5 -2 years. It was a long and thin muscular tube begins from renal pelvis at the hilus and passes backward along medial border of kidney. In the Histological structure ureter was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance. Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles. The outer layer tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings.

Key words: Ureter, Stellate Lumen, transitional epithelium, smooth muscle fiber.

Introduction

Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. Low rainfall and scanty vegetation are common in the western part of Rajasthan and the conditions become oppressive when extreme environmental conditions bring about the adaptive changes in organs necessary for physiological adjustments in these extreme ambient conditions. The present investigation has been planned to study the gross and histological structure of the ureter to justify its importance and essentiality in the body. In mammals the ureters are the chief excretory ducts of the body.

Materials and Methods

The Gross study was conducted on 15 apparently healthy adult *Marwari* Sheep (*Ovis aries*) of either sex. The Ureters from the freshly slaughtered animals were procured from Municipal slaughterhouse, Bikaner.

For the histological examination the small pieces of tissues (2 mm size) were collected from 12 ureters (6 right and 6 left). From each, the tissues were collected from different anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs, Bouin's fluid for 12 hrs, and Zenker's fluid for 18 hrs (Singh, U.B. and Sulochana, S. 1996). Fixed tissue was latter washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60℃, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the histological stains (Luna, L.G. 1968). to demonstrate different histological structures of ureters.

Results and Discussion

Each kidney was connected to the urinary bladder by a ureter. It was a long and thin muscular tube begins from the renal pelvis at the hilus and passes backward along medial border ofthe kidney. It passes ferther caudally and enters in tothe pelvic cavity. It inclines inward and downward and open in to the bladder at the caudodorsal aspect. Similar findings were also reported by Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals.

In the histological structure the ureter of Marwari sheep was composed of tunica mucosa of transitional epithelium. The mucosa was thrown on to longitudinal folds giving the lumen a stellate appearance (Dellmann HD, 1993). Lamina propria is wide which was composed of fibroelastic connective tissue with many bundles of coarse collagen fibres which was dense towards the epithelium and loose towards the muscularis mucosa. The tunica muscularis was consisted of inner longitudinal, middle circular, and outer longitudinal layers of smooth muscles (Fig1. and Fig 2.). The outer layer, the tunica adventitia is continuous with fibroelastic connective tissue which contain blood vessels and nerve endings. Similar findings were also reported by Doaa Zaghloul *et al* in Camel, Woldemeskel *et al.* (1998) in sows and Konig and Liebich (2006) and Dyce *et al* (2010) in domestic animals. Whereas A.R. Sreeranjini *et al* (2010) found that the sub mucosa of intra renal ureteric branches and ureter in Japanese quail contained collagen, elastic and reticular fibers. Tunica muscularis of ureter contained few elastic fibers among smooth muscle fibers. Tunica adventitia was comprised of loose connective tissue containing collagen and elastic fibers.

References

1. **A.R. Sreeranjini, M. P. Iyyangar and D. Pramod kumar (2010).** HISTOLOGICAL STUDY ON THE FIBROUS ARCHITECTURE OF KIDNEY AND URETER OF JAPANESE QUAIL (COTURNIX COTURNIX JAPONICA) * Tamilnadu J. Veterinary & Animal Sciences 6 (2) 107-110, March - April 2010.
2. **Dyce, K. M.; Sack, W. O. and Wensing C. J. G. (2010).** Textbook of veterinary anatomy 4th ed[n]. Saunders Comp. Philadelphia. pp: 181.
3. **Dellmann HD**. Text book of veterinary histology. 4th Edn. Lea and Febriger, Philadelphia, USA, 1993, 194-212.
4. **Doaa Zaghloul, Shireen Hafez and Thomas Caceci (2013)** Microscopic anatomy and ultrastructure of the Camelus dromedarius ureter Eur. J. Anat. 17 (4): 202-208 (2013).
5. **Konig, H. E. and Liebich, H. G. (2006).** Veterinary anatomy of domestic animals, 3rd ed[n], Schattauer, Stuttgart, Germany, pp: 375-376.
6. **Luna, L.G. (1968).** Manual of histological staining methods of the Armed Forces Institute of Pathology. 3rd ed. Mc Graw - Hill Book Company, New York.
7. **Singh, U.B. and Sulochana, S. (1996).** Handbook of Histological and Histochemical Techniques. 2nd ed. 5 -1-800, Kothi, Hyderabad, Andhra Pradesh, India. Premier Publishing House.
8. **Woldemeskel M., Drommer W. and Wendt M. (1998).** Histology and ultrastructure of the urothelium lining the ureter and the renal pelvis in sows Anatomia, histologia, Embryologia 27 (1), 51-55, 1998.

Journal of Pharmacognosy and Phytochemistry 2018; 7(2): 2309-2312

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 2309-2312
Received: 09-01-2018
Accepted: 10-02-2018

Rishi Kant
Assistant Professor, Department of Veterinary Pharmacology and Toxicology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

RP Diwakar
Assistant Professor, Department of Veterinary Microbiology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Pramod Kumar
Assistant Professor, Department of Veterinary Physiology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Correspondence
Rishi Kant
Assistant Professor, Department of Veterinary Pharmacology and Toxicology, C.V.Sc. & A.H., Narendra Dev University of Agriculture & Technology, Kumarganj, Faizabad, UP, India

Effect of *Withania somnifera* on Monocrotophos toxicity in commercial Poultry

Rishi Kant, RP Diwakar and Pramod Kumar

Abstract
The present study was conducted to investigate the protective efficacy of aqueous extracts of root and leaves of *W.somnifera* (Ashwagandha) against monocrtophos toxicity in broilers. Seventy two day old broiler chicks, were divided randomly and equally into six groups viz. Group I (Untreated Control), group II(MCP Control), *W. somnifera* root extract was given daily@ 100 and 300(mg/kg b.wt., orally) to group III and IV respectively in drinking water, *W. somnifera* leaf extract was given daily@ 100 and 300(mg/kg b.wt., orally)to group V and VI respectively in drinking water. On 21 day group II,III, IV, V andVI were administered single oral dose of MCP @ 1.34mg/Kg b.wt.($1/5^{th}$ of LD_{50}). There was no significant difference in haematological parameters in any of the experimental groups of birds after 1 day of single monocrotophos treatment except TEC which was significantly reduced in group II in comparison to group I birds. After 7 days there was a significant ($P<0.05$) decrease in the values of Hb, TEC and % lymphocytes in group II birds in comparison to group I birds. After 7 days *W. somnifera* root and leaf extract could not change the altered value of Hb to normal in groups III to VI, however leaf extract increased the depleted values of TEC and of % lymphocytes in group V and VI.
Monocrotophos significantly increased the activities of ALT, AST and ALP after 1 day of monocrotophos exposure in group II in comparison to group I birds. *W. somnifera* root and leaf extract significantly decreased ($P<0.05$) the values of these enzymes in the birds of group III to VI. In addition to that, root extract also reduced the value of serum creatinine, total protein and albumin in group IV in comparison to group II. Other parameters like globulin level, A:G ratio and activity of LDH remain unchanged. After 7 days of monocrotophos treatment activities of ALT, LDH and creatinine level were increased significantly in group II as compared to group I birds. The AST and ALP activities were unaltered in group II as compared to group I birds. Root and leaf extract showed their potential by decreasing the activity of ALT significantly in group III to VI birds in comparison to group II. However, the extract could not ameliorate the toxic effect of monocrotophos on LDH activity and creatinine level. The other biochemical parameters were unaltered.

Keywords: Monocrotophos, Ashwagandha (*Withania somnifera*) root and leaf extract

1. Introduction
Monocrotophos is an organic ester of phosphorus, which has the ability to inhibit the AChE. It is widely used to control insects and pests of rice and other crops and ectoparasiticide in animal husbandry practices (WHO 1993) [16]. Exposure of poultry to monocrotophos causes health consequences to poultry culminating in great economic loss, while also posing a potential threat to public health due to presence of pesticide residue in poultry meat (Pal and Kushwah, 1998, 2000) [8, 9]. Chronic exposure of chicks to small amount of organophosphates leads to deleterious effects on metabolism and immune system of birds (Garg *et al.* 2004) [2, 3]. Pharmacological screening of *W. somnifera* reveals that it is used as a tonic, stimulant, alterative, aphrodisiac, diuretic and abortifacient. Prolonged medication with *W. somnifera* caused a positive effect on weight, feed consumption, general resistance, liver weight and antistress effects in men and animals (Rao *et al.*, 1999, Archana and Namasivyam, 1999) [10, 1]. The present study was conducted to investigate the protective efficacy of aqueous extracts of root and leaves extract of *W. somnifera* in poultry exposed to monocrotophos.

Materials and Methods
Preparation of root and leaves extracts
After collection the plant materials were shade dried and powdered. The powders were further processed for aqueous extraction. The powder was soaked in distilled water for 24h with intermittent stirring at 40 °Cwith the help of magnetic stirrer. The infusions were filtered through muslin cloth and centrifuged at 400g for 15 minutes to get the supernatant. The filtrates were dried with the help of incubator with fan and lypholizer (37 °C) to get the final extracts.

INTEGRATION BETWEEN THE THERMAL STRESS INDEX (TGWB) AND THE LIVESTOCK STRAIN INDEX (LSI) AS A GUIDELINE FOR DAIRY FARMING IN TROPICAL CLIMATE

Pramod Kumar[1]*, R.C.Upadhyay[2], P.K.Chaudhary[1], P. K. Maurya[1], Rishikant[3], Rabindra Kumar[4], Rajesh Kumar[4] and R. P. Diwaker[5] and Vibha Yadav[5]

[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[2]Rt.HOD & Principal Scientist, Animal Physiology Division, ICAR-NDRI, Karnal-132001 (Hariyana)
[3] Department of Vety. Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[4]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP
[5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj-224229, Ayodhya, UP

Abstract

A new thermal stress index (TGWB Index), based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature suggests as a potential substitute for the temperature humidity index (THI) for cattle in tropical climate. This new stress index, found to have a high correlation to THI, is constructed from fast reading meteorological response sensors (Tdb, Twb, and Tg) that take only a few seconds to reach equilibrium. Furthermore, the TGWB Index is the first stress index using direct measurements of solar radiation and is calculated as follows:
TGWB Index = 0.78 (Tg + Twb) + 35.8
The recently suggested Livestock Strain Index (LSI) is capable of indicating physiological strain and analyzing milk production of cattle. The LSI is constructed from rectal temperature (Tre) and respiratory frequency rate (Rf) as follows:
$LSI = 5\ (Tre_{obs.} - Tre_{min.}).\ (Tre_{max.} - Tre_{min})^{-1} + 5\ (Rf_{obs.} - Rf_{min.}).\ (Rf_{max.} - Rf_{min.})^{-1}$
Where Tre_{obs} and Rf_{obs} are the observed measurements Tre_{max} and Tre_{min}, and Rf_{max} and Rf_{min} are maximum and minimum simultaneous measurements taken at any time. The LSI is scaled from 0-10, whereby each variable LSI_{Tre} or LSI_{Rf} which represent the cardiovascular and the thermoregulation systems respectively. The purpose of this study was to develop guidelines based on TGWB Index and LSI for dairy cattle for combat to heat stress. In order to integrate LSI and TGWB Index, we decided to use both the LSI_{Rf} and LSI_{Tre} component, which represents the respiratory frequency rate and the strain reflected by the cardiovascular system. Furthermore, LSI_{Rf} and LSI_{Tre} are easier to measure, are easier to implement and simplifies the integration with TGWB Index. Concomitantly, it also categorizes the strain between 0-5, the higher the value, the higher the strain.

Key words: Tropical climate, Thermal stress, Indices, Solar Radiation, LSI, TGWB Index

Introduction

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$
(Bianca, 1962),

$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$
(Thom, 1959),

$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$
(National Research Council, 1971),

$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$
(National Research Council, 1971),

$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$
(National Research Council, 1971),

$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$
(Yousef, 1985a),

The above indices have been used to calculate stress for each combination of environmental variables corresponding to the measurements made in the animals, in order to assure that each animal response was associated to a given environmental condition. The index THI1 is used to monitor discomfort of temperature and humidity in humans. The THI2 and THI7 have been empirically determined for cattle exposed to heat stress conditions in climatic chambers. How these indices from controlled environments relate to field conditions? With diurnal fluctuation of environmental variables remain unanswered (Bohmanova *et al.*, 2007). The index THI3 is used to monitor the degree of discomfort in humans. The THI5 represents cattle heat stress index, designed to indicate level of heat stress of outdoors cattle (West, 2003); and THI6 has been developed by the United State Weather Bureau to describe discomfort in humans.

THI values of 70 or less are considered comfortable, 75 to 78 stressful, and values greater than 78 because extreme distress and animals are unable to maintain normal body temperature (Silanikove, 2000). The THI fails to reflect the contributions of other environmental factors, such as airflow and thermal radiation.

As noted before, the index has gained immense popularity over the years. The temperature humidity index (THI) is in use in temperate climatic condition for cattle. The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). It is important to note the correlation of temperature humidity index (THI) to physiological responses was only partially tested and was based mainly on the correlation between the number of heat stress cases of dairy animal and the heat load as calculated by the THI. I have inroduced my new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature as follows:

TGWB Index = 0.78 (Tg + Twb) + 35.8

This newly developed index was validated by using large databases and was found to be highly correlated to the temperature humidity index (THI). TGWB Index differs from other indices that have been suggested in the past for two main reasons. First, new thermal stress index (TGWB) based on Air temperature (Tdb), globe temperature (Tg) and wet bulb (Twb) temperature, aside from using temperature

Pramod Kumar[1]*, Rishikant[2], Rabindra Kumar[3], Rajesh Kumar[3] Rajpal Diwakar[4] and Vibha Yadav[5]
[1*] Department of Veterinary Physiology & Biochemisry, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[2] Department of Veterinary Pharmacology & Toxicology, C.V.Sc. & A.H., NDUAT, Kumarganj ,Faizabad, UP 224229
[3]Department Of Veterinary Obst. & Gynac. C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229
[4&5] Department Of Veterinary Microbiology C.V.Sc. & A.H., NDUAT, Kumarganj, Faizabad, UP 224229

Abstract

An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels would be a world first and, accordingly, no previous experience in the determination of acceptable heat stress limits, criteria or indices is wholly applicable. However, some tropical countries are already at beyond high temperature and much of the knowledge gained in managing and raring of animal at such heat stress will be helpful in making adequate planning for acceptable environmental control at the greater thermal tress being contemplated. Accordingly, it is necessary to take cognisance of the dairy industry's experience in most tropical countries and of standards and regulations already established in South America and elsewhere in order to ensure acceptable conditions and control standards that compare favourably and defensibly with those in other dairy industries. Different countries uses of heat stress limits, criteria and indices were investigated as it was necessary to determine to what extent any other indices, limits or criteria would be applicable to tropical conditions. In addition, it was necessary to establish whether there was a single heat stress index that could be used in thermal stress for tropical climatic conditions. It was found that an appropriate combination of heat stress indices would be required in planning for and ultimately controlling thermal conditions in tropical climatic conditions. The solar radiations and humidity being contemplated and the concomitant potential heat hazard present too great a risk for reliance on environmental component of heat stress, such as wet-bulb temperature at present in common use locally. The study recommends that a heat stress index, preferably WBGT be used to design an modern dairy farm's ventilation system and that wet-bulb temperature be used to monitor and control the system once it is implemented.

Keywords: *Tropical, Heat stress limits, Indices, Dairy industry's, Convection, Solar Radiation, , WBGT Index.*

Introduction

Environmental conditions that is conducive to safe and productive for cattle and buffaloes. Although many aspects of a dairy farming environmental conditions would be much the same as those already prevailing in poultry, sheep, goat and other animal farming sector the variations in high metabolic energy requirement to which animal are exposed would increase by virtue of increased depth. The paper therefore offers some guidelines for the use of heat stress indices and limits as would be applicable for dairy farming.

Thermal conditions and the heat stress imposed on animal will be the most significant environmental consequences of dairy farming, indicating a need to quantify the effects of heat on animal health and their production performance. This represents a difference in purpose from the traditional concern with heat stress. The principal motivation in efforts to evaluate and control heat stress in the dairy farm has been to minimize its detrimental effects on animal. This has resulted in the development heat stress indices based same on physiological tolerance and production performance criteria. Given the critical impact that productivity will have on the success or failure of dairy farming criteria should form part of the fundamental basis for determining the thermal standards. In the past, a number of heat stress indices have been devised in attempts to combine various environment variables into a single number indicative of the heat stress imposed on cattle and buffaloes. Although such a number can provide some measure of environmental heat stress, there are many and varied criteria for evaluating the acceptability of thermal conditions for dairy farming.

Heat stress indices

The incidence of heat stress as measured by the frequency of days with THI greater than 80 has increased significantly over the 40-year period on record. This is due to both changes in the temperature variables used and also the incidence of drought as drought years appear to be also associated with high stress frequency.

In hot climates, high ambient temperatures, humidity, wind speed, and high direct and indirect solar radiation are the main environmental stress factors that impose strain on animals (Finch, 1985, Silanikove, 2000). Heat stress indices range from simple measurements of ambient air temperature to indices that try to provide a weighted estimation of all environmental factors involved. Keeping the fact that heat stress is caused by multiple environmental or thermal factors, it is often misleading to use ambient temperature alone as the indicator of heat stress. Different heat stress indices have been proposed that indicate level of thermal stress. Thom suggested a Temperature-Humidity Index (THI) based on dry bulb and wet bulb thermometers.

The Temperature Humidity Index (THI) has been widely used as a heat stress index in beef and dairy (cattle & buffaloes) industries (Stokka *et al.*, 1996: West, 1999; Mader *et al.*, 2002). Following a list of temperature humidity indices:

$$THI\ 1 = (0.15 \times T_{db} + 0.85 \times Twb) \times 1.8 + 32$$

(Bianca, 1962),

$$THI\ 2 = (0.35 \times T_{db} + 0.65 \times Twb) \times 1.8 + 32$$

(Bianca, 1962),

$$THI\ 3 = [0.4 \times (T_{db} + Twb) \times 1.8 + 32 + 15$$

(Thom, 1959),

$$THI\ 4 = (0.55 \times T_{db} + 0.2 \times Tpo) \times 1.8 + 32 + 17.5$$

(National Research Council, 1971),

$$THI\ 5 = (1.8 \times T_{db} + 32) - (0.55 - 0.0055 \times RH) \times (1.8 \times T_{db} - 26) = 0.81 \times T_{db} + 0.143 \times RH) + 0.0099 \times RH \times T_{db} + 46.3$$

(National Research Council, 1971),

$$THI\ 6 = (T_{db} + Twb) \times 0.72 + 40.6$$

(National Research Council, 1971),

$$THI\ 7 = (T_{db} + 0.36 \times Tpo) + 41.2$$

(Yousef, 1985a),

Black Globe Humidity Index:

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECT OF EXOGENOUS MELATONIN AND DIFFERENT PHOTOPERIODS ON LYMPHOCYTE PERCENT COUNT IN CHHOTANAGPURI EWE

P. K. Choudhary[1*], A. K. Ishwar[2], P. K. Maurya[1], Pramod Kumar[1]
D. Niyogi[3] and M. Kumar[4]

[1]Department of Veterinary Physiology and Biochemistry, [3]Department of Veterinary Pathology, [4]Department of Veterinary Anatomy and Histology, C.V.Sc. and A.H., N.D.University of Agriculture and Technology, Kumarganj, Ayodhya, U.P., [2]Department of Veterinary Physiology, B.V.C., B.A.U., Ranchi

Abstract

Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewe, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg were selected and selected ewes were isolated from rams 2 months prior to melatonin administration. The selected animals were allocated randomly into seven groups viz. Group-I [Normal control], Group-II [Long day (LD) control], Group-III [LD + Melatonin administration orally (3mg/day)], Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)], Group-V [Short Day (SD) control], Group-VI [SD + Melatonin administration orally (3mg/day)] and Group-VII [SD + Melatonin administration subcutaneously (1mg/day)] comprising six animals in each group. Rams were then introduced into each group after completion of exogenous administration of melatonin. Blood sample without anticoagulant in vials was collected from each animal day before the start of experiment and there after every month up to fifth month. Lymphocyte % in third and fourth month of experiment was significantly ($P<0.05$) lower in all groups (group-I to VII) in comparison to 0 day, first and second month. At fifth month, lymphocyte % was significantly ($P<0.05$) higher in group III, IV, VI and VII in composition to third and fourth month of experiment.

Keywords: Ewe, Photoperiod, Melatonin, Lymphocyte percent count

Introduction

Short days enhance immune function in individuals with robust reproductive responses to photoperiod. Total splenic lymphocyte number, and macrophage counts were significantly higher in hamsters exposed to short days, as compared to animals exposed to long photoperiods (Brainard *et al.*, 1988). Photoperiodic influences on lymphocyte number and total white blood cell count have been reported for deer mice (Blom *et al.*, 1994); short day (LD 8:16) mice possessed more white blood cells than animals maintained in long day lengths (LD 16:8). Importantly, all laboratory studies of photoperiodic effects on immune function have reported enhanced immune function in short day lengths (Nelson and Demas, 1996). Although many field studies support this hypothesis, with data suggesting enhanced immune function and decreased disease prevalence during the winter as compared to the summer, a substantial number of studies have reported the opposite pattern of results (Nelson and Demas, 1996); i.e., reduced immune function is coincident with the short days of winter. These conflicting results can be resolved by considering additional environmental factors, not usually manipulated in laboratory studies. For example, winter-associated stressors (e.g., restricted food and low ambient temperatures) appear to counteract short day enhancement of immune function in the lab.

Exogenous administration of melatonin increased the lymphocyte percentage in Broiler chicks (Abozahra *et al.*, 1998), Rats (Anwar *et al.*, 1998), and Squirrels (Rai *et al.*, 2009). Rai and Haldar (2003) reported daily subcutaneous injection of melatonin at 17:30 to 18:00 hr significantly increased the lymphocyte count of blood in adult male squirrels, while pinealectomy decrease percent lymphocyte count in peripheral blood and bone marrow. The precise mechanism responsible for this melatonin induced increase in lymphocyte percentage is not clear. However, several mechanisms may be involved in this respect. Haldar *et al.* (2006) accessed the effect of melatonin on immune parameters in a seasonally breeding animal, the Indian palm squirrel F. pennant and bird P. asiatica during reproductive phases in vivo as well as in vitro. Melatonin treated squirrels and birds showed an increase in percent lymphocyte count (% LC) and percent stimulation pinealectomy in squirrels. Melatonin administration recovered all the decreased immune parameters to the control level (Rai and Haldar, 2003). MEL supplementation also enhanced all immune parameters in both in vivo and in vitro, suggesting that the immune system was sensitive during the reproductively active phase to MEL when peripheral melatonin level was low and the role of melatonin could be important for the maintenance of the immune status of seasonal breeders.

As reported by Etim *et al.* (2014[a]) immune status is a function of leucocytes, lymphocytes and Neutrophils. Lymphocytes are known to play key roles in immune defense system of both man and animals (Etim et al., 2014[b]). The objective of this experiment was to determine Lymphocyte percent count in Chhotanagpuri sheep after exogenous administration of melatonin following different photoperiods.

Materials and Methods

The present study was conducted in Department of veterinary physiology, College of veterinary science and A.H., Birsa Agricultural University, Kanke, Ranchi-6, Jharkhand located at 23.36°N latitude and 85.33°E longitude with an altitude of 651 m above mean sea level. Design of experiment was approved by the Institutional Animal Ethics Committee vide letter no.-139/528/RVC/IAEC. Forty two (42) apparently healthy, non-pregnant, non-lactating Chhotanagpuri ewes, having body weight ranging between 14.11±0.09 to 15.38±0.06 Kg reared under uniform managemental husbandry practices were selected. Selected ewes were isolated from rams prior to melatonin administration. The selected animals were allocated randomly into seven groups (viz. group-I to group-VII) comprising six animals in each group. Group-I [Normal control]:- The animals in this group were exposed to normal variation in day length. Group-II [Long day (LD) control]:- In this group in addition to natural sun light, artificial light was provided to animal for maintaining 16-18 hours of light every day for the period of one month and considered as long day control. Group-III [LD + Melatonin administration orally (3mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-IV [(LD + Melatonin administration subcutaneously (1mg/day)]:- In this group in addition to natural sun light, artificial light was provided for maintaining 16-18 hours of light every day for the period of one month and after that 1 mg melatonin was administered subcutaneously for one month to each animal. Group-V [Short Day (SD) control]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month. This group served as short day control. Group-VI [SD + Melatonin administration orally (3mg/day)]:- Animals in this group were provided only 8 hours natural day light and were then kept in a light-proof shed for 16 hours exposure in dark every day for the period of one month and after that 3 mg melatonin was administered orally for one month to each animal. Group-VII [SD + Melatonin administration subcutaneously (1mg/day)]:- Animals in this group were provided only 8 hours natural day light and then were kept in a light-proof shed for 16 hours exposure in dark every day for the period

VOL. VIII, SPECIAL ISSUE, RKVY NOV-2018 SEMINAR NDUAT AYODHYA MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

SOCIO-TOXICOLOGICAL SURVEY TO IDENTIFY THE ARSENIC PRONE AREA IN FAIZABAD DISTRICT OF EASTERN UTTAR PRADESH

Yadav JP[1],Varma R[2], Kant R[3], Saif Md.[4], Kumar P[5] and Kumar R[6]

[1]M.V.Sc. Scholar, Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[2] Professor Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry , Sardar Vallabh Bhai Patel University of Agriculture and Technology, Modipuram, Meerut, U.P. India,

[3]Assistant Professor, Department of Veterinary Pharmacology and Toxicology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[4]Ph.D. Scholar, Department of Veterinary Pharmacology and Toxicology, DUVASU Mathura U.P. India,

[5]Assistant Professor, Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India,

[6]Assistant Professor, Department of Veterinary Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry Kumarganj, Faizabad U.P. India

Abstract

Arsenic in drinking water is the major cause of arsenic toxicity. Most of the reports highlighted chronic Arsenic toxicity in animals is increasing. In contrast inorganic arsenic compounds are well known as animal and human carcinogens, based on sufficient evidence in carcinogenicity in animals. From health point of view gastrointestinal effects, anaemia, peripheral neuropathy, skin lesions, hyper pigmentation, liver and kidney damage in animals and humans are common findings in arsenicosis. Inorganic exposure in animals by the inhalation has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in animals has been linked to a form of skin cancer and also to bladder, liver and lung cancer. A socio-toxicological survey was conducted in order to find out arsenic prone area in Faizabad district. Survey report showing Arsenic contamination in water, soil and poultry meat of Faizabad district (73% Veterinary/human hospitals/farmers informed about the contamination) as depicted in table no.1. This helps in the selection of centers. After survey and collection, samples were analyzed in laboratory. 80 samples each of water, soil and poultry meat collected from different locations of Faizabad districts were analyzed for detection of arsenic level. Arsenic contents of samples were detected by Hydride Generation Atomic Absorption Spectrophotometer (HG-AAS). The average arsenic contents of water, soil and poultry meat of different areas are 0.00550±0.00304 µg/g, 5.5500±2.9810 µg/g and 0.17924±0.05247µg/g respectively.Correlation analysis showed a significant positive correlation between drinking water, soil and poultry meat (Correlation coefficient $r=0.623$, $p<0.01$) and correlation was also found positive at (Correlation coefficient $r=0.497$, $p<0.05$). On the basis of above observation and results this can be concluded that periodical survey, study and monitoring of level of arsenic in water, soil & poultry meat is essential.

Keywords: Arsenic,Hydride Generation Atomic Absorption Spectrophotometer (HG-AAS).

Introduction

Arsenic is a widespread pollutant in various regions of the world (Flora *et al.*, 2005). Weathering of rocks converts arsenic sulfides to arsenic trioxide, which enters the arsenic cycle as dust or by dissolution in rain, rivers, or groundwater (Mandal and Suzuki, 2002). The occurrence of high concentrations of arsenic in groundwater used for drinking purpose has been recognized as a major public health concern in several parts of the world. Arsenic has been found to accumulate in the plant tissues and results in reduction in their biomass (Drlickova *et al.*, 2013).

The World Health Organization (WHO, 2007) permissible limit for arsenic is 0.01mg/l for drinking water and FAO permissible limit is 0.10mg/l for irrigation water (Bhattacharya *et al.*, 2009; Ahsan and Del Valls, 2011), whereas the concentrations of arsenic in non-contaminated soils range from 0.1to10mg/kg (Kabata-Pendias and Pendias, 1992). The immediate and long-term impact of using arsenic contaminated water for irrigating paddy soils is a burning concern as arsenic can transfer from water to soil and several studies have proven this phenomenon. It is seen that the total exposure of arsenic to humans and animals is the sum total of exposures from the diet, drinking water, direct ingestion of soil and dust, inhalation and percutaneous absorption (WHO, 2000; Hopenhayn, 2006). The areas across the Gangetic plains in India and Nepal also recently reported as the area affected from Arsenic (Maharjan *et al.*, 2005). Drinking water is the primary and main route of exposure to arsenic. Maximum Permissible Limit(MPL) is the standard concentration of arsenic in drinking water which is not hazardous, is set by the US EPA at 10µg/l (EPA, 2001) and the value for concentration of arsenic in drinking water is recommended by the WHO is also 10µg/l (WHO, 1992). In West Bengal (India), the arsenic concentration in drinking water is about 60 to 3700µg/l and about 40 million people are affected from it (Acharyya, 2002). In middle Ganga plain, Bihar, 206 tube wells (95% of total) were analyzed for arsenic content and showed that 56.8% tube wells have exceeded arsenic concentration of 50µg/l and 19.9% have more than 300µg/l (Chakraborti *et al.*, 2003; Acharyya *et al.*, 1999). Arsenic may be present in the organic or inorganic form (Ahmed, 2003). Of the inorganic forms, arsenite (trivalent) and arsenate (pentavalent) are the two most prevalent and potential dangerous forms, while organic form of organoarsenicals is also important (Dopp *et al.*, 2004; Sharaf *et al.*, 2013).

Himalayan Mountain and Tibet plateau are considered as the biggest source of arsenic contamination in the Gangetic region and this contamination is evidently becoming life threatening in almost every year (Chakraborti *et al.*, 2009). Geographically Uttar Pradesh is situated in the northern region of India and border of Nepal and comes under upper and middle gangetic plain. The river Ganga and Ghaghara are two major river flows from northeast to southeast. Arsenic was introduced as a contaminant in Ballia district of U.P. for the first time in 2003 (Yasunori *et al.*, 2012). Status of Arsenic Contamination in Eastern U.P.: In U.P. Jal Nigam and UNICEF combinedly reported and identified in 18 districts. Arsenic above the 10 ppb limit for drinking and Arsenic according to WHO limit was found in 31 districts (Chaurasia *et al.*, 2015; WSSO U.P. 2011). Times of India also reported "Ground water arsenic contamination of Uttar Pradesh exceeds to the value of BIS (Bureau of Indian Standards) permissible limit of 0.01 mg/liter across 31 districts of the state.

Pandey *et al.* (2015) reported alarming situation and highly contaminated districts are Bahraich, Ballia and Lakhimpur Kheri among than Ambedkar Nagar, Bareli, Basti, Bijnaor, Chaudauli, Faizabad, Ghazipur, Gorakhpur, Meerut, Sant Ravidar Nagar, Shahjahanpur, Siddarth Nagar, Sitapur, Unnao and Kanpur (Yasunori *et al.*, 2012).

Materials and Methods

This study was designed to **identify the** different **arsenic prone** locations in Faizabad district **of eastern Uttar Pradesh.** The major objectives were: –

Vol. XXXX, Oct 2021 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

MORINGA OLEIFERA LEAF EXTRACTS ON CARCASS CHARACTERISTICS AND MORTALITY OF BROILER CHICKENS

A. Verma[1], P. S. Pramanik[1], M. K. Verma[2], Jaswant Singh[2], Ruma Devi[3], A.K. Srivastav[4]andGaurav Panday[1]
[1]Dept. of Livestock Production Management, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya,
[2]Department of Animal Genetics and Breeding, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India
[3]Department of Livestock Product Technology, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India
[4]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India
ajeetverma95@gmail.com

MS 2738 *(MS Received: 25.07.2021; MS Revised: 29.08.2021; MS Accepted: 29.09.2021)*
(RESEARCH PAPER IN LIVESTOCK PRODUCTION MANAGEMENT)

Abstract

The present study was carried out to evaluate the influence of Moringa oleifera leaf extracts on carcass traits and mortality of broiler chickens. A total of 250-day-old broiler chicks (Vencobb-430) were randomly distributed into five groups with 5 replicates of 10 birds in each. Different dietary treatments were: basal diet with no supplement (NC- negative control) and basal diet supplemented with antibiotics (PC-positive control), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE). Percent weight of various cut parts, eviscerated weight and drawn yield were evaluated after 35 days of experiment. The results showed significantly higher eviscerated weight and drawn yield percentage in Moringa extracts supplemented groups compared to PC group. PC and MOAQE group recorded significantly (P<0.05) higher drumstick % compared to NC, MOEE and MOALE group. Moringa extracts group recorded significantly (P<0.05) lower mortality than PCand NC group birds. From these results it was concluded that supplementation of Moringa extract of 1.5% Moringa oleifera leaf powder improved the carcass traits and reduced the mortality of birds.

Key words: Broiler, Extract, Carcass, Mortality and Moringa (words in alphabetical order)

Introduction

Major cost involved for poultry enterprise is in the form of feed. Various approaches such as feed supplements and additives are being used to obtain more net return and to minimize expenditure in feed (Agasheet *al*., 2017). *Moringa oleifera* leaf (MOL) has fascinated great attention as a non-traditional feed component because of its unique qualities. Moringa oleiferagrows fast, drought-tolerant tree native belonging to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. Moringa is currently cultivatedglobally in the tropics and subtropics (Fahey*et al*., 2001). Crude protein content in Moringa varies from 25% to more than 30% on a dry matter basis (Melesse et al., 2013), with a high proportion of essential amino acids (Liu *et al*., 2016). Moringa leaves, flowers and Pods are used as good sources of vitamins A, B and C, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta-carotene, calcium, iron and alpha-tocopherol (Dahot 11, 1988). Moringa leaves are the preferred part of tree for use in animal diets as leaf meal due to high nutritional and medicinal properties (Abbas, 2013). The meat obtained from broiler chickens is an excellent source of protein, vitamins, mineralsand lower in fat content, so having a great demand among non-vegetarians(Naji *et al*., 2013).Addition of*Moringa oleifera* leaf meal in broilers diet resulted significant increase in dressed weight, eviscerated weight and dressing percentage (Ayo-Ajasa *et al*. 2016). Dietary supplementation of Moringa leaves would be a potential strategy to improve the meat quality in broilers due to its antioxidant potential. It was further reported that phytosterols could lower malondialdehyde content and increase glutathione concentration in the breast muscle of broiler chickens (Na *et al*., 2013).

This study was carried out to evaluate the effect of different extracts (5%) of *Moringa oleifera* leaves powder as feed supplement in broiler diets on carcass characteristicsand mortality of broiler birds. (Please correct red marks)

Materials and Methods

The present experiment was conducted after an approval from institutional animal ethical committee (IAEC)' was obtained vide reference number IAEC/CVSc/P-36/2019. A total of 250 one-day old Vencobb-430 strain chicks were randomly allocated into five dietary treatment groups with 5 replicates of 10 chicks in each. The chicks were kept on five dietary treatments which includes a basal diet without any additive in negative control (NC) or that supplemented with antibiotics (Positive control-PC), aqueous extract of 1.5% Moringa powder (MOAQE), ether extract of 1.5% Moringa powder (MOEE) and alcoholic extract of 1.5% Moringa powder (MOALE) in basal diet. Birds were fed *ad libitum* in different phases of experimental trial. The composition of formulated experimental diets as per BIS (2007) has been given in Table 1.

The chicks were kept on deep litter system under uniform standard management conditions with availability of clean, fresh and wholesome drinking water. Mortality was recorded during the entire research period. At the end of trial one bird per replicate (5 birds/treatment) were selected randomly for the carcass evaluation and sacrificed after 12 hours pre-slaughter fast though drinking of water was allowed. After complete bleeding carcass were dipped in hot water (58°C) for 1-2 minutes and feather were removed. Evisceration was done by making a slit from tip of breast bone up to the area around the cloaca. Thorough washing and cleaning were done after evisceration. After that the carcass were kept hanging on the special racks for 5-10 minutes. The visceral organs were removed by supporting the bird with one hand via the incised abdomen. Eviscerated carcasses were weighed and cut parts like thigh, drumstick, breast, wings, back, head, neck and shank were also weighed.The relative weight of dressed, drawn yield and different edible cuts were calculated as percentage of live weight.

The data were analysed under completely randomized (CRD) by employing one way analysis of variance (Snedecor and Cocran, 1994) and means of different dietary treatments were compared with Duncan multiple range test. The P value lower than 0.05 was thought-out significant.

(Please correct red marks)

Results and Discussion

Carcass characteristics:

The data pertaining to the carcass traits of broilers presented in Table 2. The results showed that the dressed weight and thigh weight of different groups was similar and showed no significant (P>0.05) effect of various Moringa extracts. The eviscerated weightof aqueous extract (72.24), ether extract (73.10) and alcoholic extract (73.09) supplemented group broilers were similar to NC (72.05) group, however significantly (P<0.05) higher than PC (70.39). The drawn yield of MOAQE, MOEE, MOALE and NC also significantly (P<0.05) higher than PC group. Leg and drumstick weight % of PC group was significantly (P<0.05) higher than MOEE and MOALE group. However, leg weight was

International Journal of Plant & Soil Science

34(1): 63-70, 2022; Article no.IJPSS.81077
ISSN: 2320-7035

Effect of Land Configuration and Moisture Regimes on Productivity of Hybrid Maize (*Zea mays* L.) in Summer Season

Vishuddha Nand [a*], Vinay Kumar Patel [b] and Ashish Kumar Srivastav [a]

[a] Department of LFC, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.
[b] Department of Agronomy, ANDUAT, Kumarganj, Ayodhya, Pincode -224 229 (U.P), India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJPSS/2022/v34i130825

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/81077

Original Research Article

Received 17 November 2021
Accepted 20 January 2022
Published 25 January 2022

ABSTRACT

An experiment was conducted on "Effect of land configuration and moisture regimes on productivity of hybrid maize (*Zea mays* L.) in summer season," during 2018-19 at Agronomy Research Farm, ANDUA and T, Kumarganj, Ayodhya (U.P.). The experiment accomplished of 12 treatment combinations and laid out in split plot design, replicated three times. The Experiment consisted of three land configuration *viz.* flat bed planting (P_1), ridge planting (P_2) and paired row planting on raised bed (P_3) were kept in main plots and four moisture regimes *viz.*0.5 IW/CPE ratio, 0.7 IW/CPE ratios, 0.9 IW/CPE ratios and 1.1 IW/CPE ratios were allotted in sub plots. The experimental results revealed that growth parameters, such as plant height, leaf area index, dry matter accumulation, days to 50 percent ear emergence and days to50 percent maturity and yield were obtained maximum with the paired row planting methods followed by ridge planting and flat bed planting and yield attributes such as number of cobs plant^{-1}, number grains row^{-1}, number of grains cob^{-1}, cob length (cm), cob girth (cm), grains weight cob^{-1}(g), cob weight (g), shelling percentage (%), grain yield (q ha^{-1}), stover yield (q ha^{-1}), and biological yield (q ha^{-1}) were also increased similarity in same treatment. In case of moisture regimes, the same trends were observed maximum when applied irrigation at 1.1 IW/CPE ratios as compared to other moisture regimes.

*Corresponding author. E-mail: vishuddhanand84nd@gmail.com;

GENETIC STUDIES ON REPRODUCTIVE TRAITS OF HARIANA COWS

***Ashish Kumar Srivastava, Jaswant Singh and V.K. Singh**
*Assistant Professor, Department of LFC
College of Veterinary Sciences and Animal Husbandry
N.D.U.A.T., Kumarganj- Faizabad (U.P.)

Abstract

The performance records of 211 Hariana cows, progeny of 27 sires, born during the year 1966 to 1985 having at least records up to second calving were utilized in this study. These cows were maintained at D.D.D. farm, Mathura and livestock farm, Madhurikund (Mathura). The average post partum oestrus interval was estimated to be 185.43± 11.18, the heritability estimate of post partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non significant and the variation in post partum oestrus accounted due to sires was very small (8.7%) in total variation. The least squares means and their standard errors of number of service per conception were estimated to be 2.19±0.26. The heritability estimate of the number of service per conception was estimated to be 0.294±0.210. The contribution of sires was 21.8% in the total variation of the trait.

Introduction

The cow is an efficient machine for converting farm crops into useful human food like milk and milk products, which are the main source of animal protein in the diet of a large vegetarian population of the country. Hariana breed of zebu cattle has been well established dual-purpose breed known for its milk yield as well as for draught ability. The breed has reduced significantly and is continuing to decline at an alarming rate. Apart from the declining population, Hariana cattle have also deteriorated in their productivity (Joshi et al., 1995).

Materials and Methods

The present study was undertaken on Hariana cows. All the animals taken into consideration were farm bred. The data used in this investigation were collected from the pedigree sheets, milking register and breeding record of Hariana cows maintained at DDD Farm, Mathura. The performance record of 211 cows, having at least record up to second calving were collected for genetic studies. The statistical analysis of the data was carried out by using the LSMLMW (Least Squares and Maximum Likelihood Method)- Harvey (1990) PC-2 version computer programme and Henderson (1953) model were used.

Results and Discussion

The least squares mean of the post-partum oestrus interval along with their standard errors have been presented in table 1. The average post-partum interval was estimated to be 185.43±11.18 days. The frequency of animal in various PPO groups (class interval of 40 days) is about 23.69% animals had post-partum oestrus interval below 90 days. The maximum frequency of animals was in 90 to 130 days group (26.54%). Present observation is comparatively higher than the average of post-partum interval reported by Luktuke and Subramanium (1961), Singh et al., (1964), Arora et al., (1971), Acharya et al. (1971) and Khanna (1998) for Hariana cows. Whereas, Kohli and Suri, 1957, Kohli and Suri, 1960 and Tomar and Arneja, 1972 have reported comparatively higher post-partum oestrus in Hariana cattle.

Least squares analysis of variance was performed to study the effect of farm, period and session of calving are present in table 2. The perusal of the table revealed that the effect of farm was found to be non-significant on post-partum oestrus interval in Hariana cows, although the contribution of farm was highest (83.5%) in total variation. However, Ashraf et al., (2000) observed highly significant farm effect on post-partum oestrus interval. The effect of period and season of calving were found non-significant. However, Mahmoud et al., (1991) observed a significant effect of month of calving.

Heritability estimate of post-partum oestrus interval was estimated to be 0.021±0.175. The magnitude of the effect of sires was non-significant and the variation in PPO accounted for due to sires was very small (8.7%) in total variation. The findings were indicative of zero heritability for this trait in these animals. Similar observations were reported by Prasad (1958) for Tharparkar cattle and Singh et al., (1964) for Hariana cattle.

Conclusion

Any selection programme based on post-partum oestrus interval will not prove beneficial in these cattle because the genetic variability for this character in these animals does not seem to exist. In view of the above observations, improvement in managemental practices may lead improvement in this trait.

References

Acarya, R.M.; Dhillon, J.S. and Agrawal, S.C. (1971). A note on the factors affecting post-partum oestrus interval in Hariana cattle. Indian J. Anim. Sci. 41 (7) : 524-525.

Arora, K.L.; Tomar, S.S. and Singal, S.P. (1971) Factor effectin the reproductive efficiency of Hariana cattle the duration of post-partum breeding interval. The Indian Veterinary Journal **48**: 1015-1019.

Joshi, B.K.; Tantia, M.S.; Kumar, P.; Gupta, Neelam; Vij, P.K.; Nivsarkar, A.E. and Sahai, R. (1995). Hariana cattle a monograph on breed characterstics. NBAGR Research Bulletin No (3), NBAGR P.B. 129, Karnal-132001, India.

Khanna, Neetu (1998). Studies on certain aspects of reproductive performance in Hariana and crossbred cattle. M.V.Sc. thesis in Vet. Obstetrics and Gynaecology submitted to C.S. Azad Univ. of Agri. And Tech. Kanpur.

Kohli, M.L. and Suri, K.R; (1960). Longevity and Reproductivity in Hariana cattle. Indian J. of Veterinary Sci. and A.H. 27 (1): 105-110.

Luktuke, S.N. and Subramanium, P.; (1961). Studies on certain aspects of oestrus phenomenon in Hariana cattle. J.Reprod. Fert. 2: 199-200.

Singh, O.N.; Prasad, J.N. and Prasad I.B. (1964). Conception rate of Hariana and Bachur cows under artificial breeding condition in the farm. Indian Vet. J. 41: 513-520.

Tomar, N.S.; Srivastava, K.N. and Singh B.P. (1976). Heritability estimates of fertility of Hariana heifers and their age at first calving. Indian J. Ani. Health. June: 63-66.

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; SP4: 254-258

(Special Issue- 4)
International Conference on Food Security and Sustainable Agriculture
(Thailand on 23-26 December, 2018)

Impact of integrated nutrient management (INM) on growth of Berseem (*Trifoliumalexandrinum* L.) at various cutting stages

Vishuddha Nand, RK Gupta, RS Yadav, KD Singh, RK Yadav and AK Srivastav

Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Gupta
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

RS Yadav
Department of Agronomy, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

KD Singh
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

RK Yadav
Department of Crop Physiology, College of Agriculture, NDUAT, Faizabad, Uttar Pradesh, India

AK Srivastav
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Correspondence
Vishuddha Nand
Department of LFC, College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad, Uttar Pradesh, India

Abstract
An experiment was conducted during winter season of 2016-17 on Berseem (cv. Mescavi). The experiment comprised of twelve treatments viz. T_1 (control), T_2 (100% RDF, 20 kg N + 80 kg P_2O_5 ha^{-1}), T_3 (100% N through Farm Yard Manure (FYM), T_4 (100% N through Poultry Manure), T_5 (50% RDF +50% N through FYM), T_6 (50% RDF +50% N through Poultry Manure), T_7 (50% N through FYM+50% N through Poultry Manure), T_8 (50% RDF +25%N through FYM +25% N through Poultry Manure), T_9 (75% RDF +25% N through FYM), T_{10} (75% RDF +25% N through Poultry Manure), T_{11} (25% RDF +75% N through FYM) and T_{12} (25% RDF +75% N through Poultry Manure) were tested in Randomized Block Design with three replications. the results revealed that the maximum plant height, fresh weight of leaf and stem, dry weight of leaf and stem, shoot : root ratio $plant^{-1}$ and number of nodules $plant^{-1}$ were observed with the application of 100% RDF (20 kg N + 80 kg P_2O_5 ha^{-1}) followed by 75% RDF +25% N through poultry manure and 75% RDF +25% N through FYM.

Keywords: FYM, Poultry manure, INM, growth, RDF, plant height, and leaf

Introduction
Berseem (*Trifoliumalexandrinum* L.) is one of the most important winter forage crop of India, due to high forage yield, palatability and nutritive value. It has become a very popular as *rabi* forage in irrigated areas or all most all over the country. Berseem belongs to one of the largest and most useful plant family leguminaceae and sub family faboideae. Berseem is known as king of fodder crops and it is popular among the world. It is one of the oldest cultivated crops, domesticated in Egypt and later introduced into many other parts of the world. Berseem was introduced in India in 1903 (Roy *et al*., 2009) [3]. It is now widespread in the irrigated regions of west and south Asia. Most of the farmers conserved the berseem as hay to get cheap, palatable and nutritive forage during scarcity periods or early winter and summer. Berseem is a cheapest source of increasing milk production as well as improving soil fertility. Berseem can be sown in early autumn and can thus provide feed before and during the colder months but the optimum conditions are 18-25 °C. If the winter temperature falls to 6-8° C the crop growth is severely affected. This is nutritious, succulent and palatable fodder available for fairly long period during winter, spring and early summer (Chaterjee and Das, 1989) [2]. Grazing is possible though less common than cutting. The most important cultural practices that need to be carefully adjusted to achieve maximum benefit from the forage grass-legume mixtures. The ability to fix atmospheric nitrogen and convert it to a useable form for plant growth is the main trait to these legumes (Allen and Allen, 1981) [1].

Poultry manure is an excellent soil amendment that provides nutrients for growing crops and also improves soil quality when applied widely, because it has high organic matter content combined with available nutrients for plant growth (Ryssen *et al*., 1993) [7]. The application of FYM with chemical fertilizers and composted with rock phosphate to improve crops yield is very well established (Shafi *et al*., 2012) [8]. Fertilizers play an important role in enhancing forage productivity. Chemical fertilizers are soluble and immediately available to the plants; therefore, the effect is usually direct and fast, the price is lower and they are quite high in

ASSOCIATIONS AMONG BODY CONDITION SCORE, PRODUCTION PERFORMANCE AND UDDER HEALTH STATUS IN DAIRY COWS

Vikas Singh[1], V. K. Singh[2], P. S. Parmanik[1], A.K.Verma[1] and A.K.Srivastav[3]
[1]Department of Livestock Production Management
[2]Department of Animal nutrition
[3]Department of L.F.C
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

To assess the associations among body condition score at calving (BCSC), BCS during lactation (BCSL), production performance and udder health status of dairy cows, 50 cows (HF cross) at 2nd parity were selected randomly. The animals after random distribution into 3 groups i.e. group I (BCS<3.0, thin), group II (3.0<BCS>3.5, moderate), group III (BCS>3.5, fat) kept in observation for 120 days. The BCS of group-III cows were significantly ($P<0.05$) higher than group I. The FCM, fat and SNF was positively correlated with BCSC and negative with BCSL. The somatic cell score (SCS) was correlated negatively with BCSC and positively with BCSL.

Key words- BCS, Milk, Milk composition, Udder health, SCS

Introduction

Milk quality is as significant as the milk quantity in dairy animals. High yielding dairy cows had higher incidence of mastitis that can be assessed by somatic cell count (SCC) of milk (Kadarmideen and Bryce, 2001). Optimal body condition of dairy cow is important for obtaining elite herd and quality milk. Low or higher body reserves may pose a risk of lower milk yield and higher SCC in milk respectively (Berry et al., 2007). High yielding dairy cows exhibit negative energy balance after calving which may influence both immune and metabolic system of the individual that predispose the animals to mastitis. Body condition score had a favourable correlation with SCC, but it was not strong (Berry *et al* Loc. cit.). Dang et al., (2010) reported non-significant relationship between BCS and SCC. Hence, it is postulated that there are no consistent results regarding the relationship between body condition score and somatic cell counts of the dairy animals. Therefore, the present study was carried out to investigate the association among body condition score, production performance and udder health status of dairy cows.

Materials and Methods

This study was carried out in the area under subtropical zone of Indo-Gangetic plane. Fifty lactating dairy cows (HF cross) of second parity available at the Teaching Livestock Farm in the College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad (U. P.) and in the small dairy farms of the surrounding villages were selected. Observations were recorded for 4 months. The animals in farm and field conditions were maintained under loose housing system and the stanchion system, respectively. The data collected at fortnightly intervals were, the Body Condition Score (BCS), production performances and Somatic cell count (SCC). Milk yield of selected animals in the farm and the field were recorded on the observation days both morning and evening. Milk samples were collected directly from the animal during milking to assess the milk composition such as fat, SNF (solid not fat), CLR (corrected lactometer reading) by EKO milk ultra, milk analyser (Milkana KAM98-2A). The milk yield was further corrected on 4% fat basis (Fat corrected milk, FCM) according to the formula given by Gaines (1928) as under-

FCM = 0.4 × milk yield (l) + 15 × milk fat (kg).

Body condition score of animals after calving were assessed in the morning milking by the chart formulated by Prasad (1994) having 1-6 scale with 1 indicating under body condition and 6 representing over body condition of the dairy cows. 1 to 6 scales were further splitted in to half or quarter point increment (e.g., 2.5 or 3.25). For the better interpretation of BCS effect on the milk yield, milk composition and udder health status, the animals were divided in to three groups on the basis of BCS at calving i.e. group-I (BCS <3.0, thin), group-II (3.0≤BCS≥3.5, moderate) and group-III (BCS > 3.5, fat). The udder health status was determined by somatic cell count (SCC) of milk immediately after collection as per methodology of IDF (1984). The SCC was log-transformed into the fortnightly test day observation SCS (Somatic cell score) as $SCS=\log_{10}SCC$ (Mrode and Swonson, 1996).

The collected data were analyzed by SPSS (version 11.5). The means of various measurements were compared by Duncan's Multiple Range test (Duncan, 1955). The Pearson's correlation coefficient was estimated to find relationships among observations.

Results and Discussion

Out of 50 animals, 13 cows were classified as thin (group–I), 20 as moderate (group–II) and 17 as fat (group–III) at parturition. BCS of cows at calving was 2.83±0.06, 3.38±0.03 and 4.22±0.11, in group I, II and III, respectively (Table-1). BCSC differ significantly ($P<0.05$) among the three groups of cows. The BCS during calving to 15 days were significantly ($P<0.05$) higher than rest period of lactation. The declining BCS might be due to mobilization of body fat reserves to cover milk production during early lactation (Buckley *et al.*, 2000, Friggens *et al.*,

Table1: Relationships between the BCS level at calving and BCS development in the particular monitored periods of lactation

Monitored periods during lactation (days)	Cows			
	Group-I (BCS<3)	Group-II (3<BCS≥3.5)	Group-III (BCS>3.5)	Period mean
	BCS after calving (points)			
0	2.83^{c}±0.06	3.38^{bA}±0.03	4.22^{aA}±0.11	3.43^{A}±0.07
15	2.67^{c}±0.09	3.19^{bA}±0.05	3.96^{aA}±0.11	3.34^{A}±0.09
30	2.63^{b}±0.12	2.82^{bB}±0.10	3.31^{aB}±0.09	2.95^{B}±0.07
45	2.47^{b}±0.11	2.74^{abB}±0.12	2.95^{aC}±0.10	2.75^{C}±0.07
60	2.40^{b}±0.10	2.71^{aB}±0.09	2.89^{aC}±0.07	2.69^{C}±0.06
75	2.46^{b}±0.13	2.67^{abB}±0.11	2.83^{aC}±0.10	2.68^{C}±0.07
90	2.51^{b}±0.14	2.72^{abB}±0.13	2.89^{aC}±0.09	2.73^{C}±0.07
105	2.47^{b}±0.13	2.75^{abB}±0.11	2.87^{aC}±0.05	2.73^{C}±0.07
120	2.58^{b}±0.13	2.79^{abB}±0.07	2.91^{aC}±0.07	2.78^{BC}±0.06
Overall	2.53^{c}±0.04	2.80^{b}±0.03	3.08^{a}±0.04	2.83±0.03

Values with different superscripts small letter in a row differ significantly: ($P<0.05$)
Values with different superscripts capital letter in a column differ significantly: ($P<0.05$)

ISSN No.- 2394-0247

RESEARCH ARTICLE

Influence of Different Therapy on Hematological Markers and Fertility Response in Anestrus Sahiwal Cows

Safayat Husain[1], Rajesh Kumar[1]*, Bhoopendra Singh[1], Sushant Srivastava[1], Rabindra Kumar[1], Pramod Kumar[2], Ashish Srivastava[3]

Abstract

The study was designed to evaluate influence of different therapy on hematological markers, resumption of ovarian cyclicity and conception rate in 24 anestrus Sahiwal cows, which were randomly and equally allocated to four groups as G1, G2, G3 and G4. Lugols iodine (2%, cervical painting with per rectal massage of genitalia thrice on alternate day) XXX herbal bolus (1 bid for 2 days, repeated on day 11 & 12 later in non-respondents) and modified ovsynch protocol (progesterone 100 mg s/c once a day for 6 days followed by GPG) was administered in G1, G2 and G3, respectively, while G4 kept as untreated control. All these animals were dewormed with bolus fenbendazole 3 g plus ivermectin 100 mg, once and supplemented with mineral mixture 30 g/day for 21 days before above therapies. Blood samples were collected thrice, i.e., on day 0, day of induced estrus/AI and day 21 post-AI (day 0, 21 and 63 in non-respondents) for hematological analysis. In general, hemogram and leucogram did not vary significantly within and among different groups, except neutrophil and lymphocyte. Cent per cent estrus induction response was observed in treatment group G1, G2 and G3, however, none of the cows resumed cyclicity in untreated control group G4. The treatment to estrus induction interval was 9.17±2.34, 8.33±2.36 and 16±0.00 days; treatment to fertile estrus interval was 33.6±8.40, 42.0±8.57 and 29.4±5.14 days and overall conception rate was 83.33, 66.66 and 83.33 % in group G1, G2 and G3, respectively, while nil in untreated anestrus cows.

Keywords: Anestrus, Conception, Estrus induction, Sahiwal cows, Therapy.

Ind J Vet Sci and Biotech (2020): 10.21887/ijvsbt.16.(2,3,&4).17

Introduction

Bovine anestrus syndrome is a most common single cause of infertility in dairy cattle that leads to huge economic losses in terms of prolonged calving interval, reduced calf crop and shorter productive life. Malnutrition is the most common cause of true anestrus featured by absence of estrus cyclicity with small smooth inactive ovaries. Bovine anestrus syndrome is a multifactorial disorder of the reproductive cycle which is characterized by absence of estrus signs manifested either due to lack of expression of estrus or failure of its detection. It can be normal physiological (pregnancy, lactation and in early postpartum period) or pathological (metritis, fetal resorption/PCL, pyometra, maceration and mummification). Many non-hormonal and hormonal drugs have been used to treat anestrus (Kumar *et al*., 2011; Dhami *et al*., 2015; Dhami *et al*., 2019; Kumar *et al*., 2020[a]). Among herbal therapeutics, various type of tropical plants are used traditionally to augment the reproductive performance. Some plants contain secondary metabolites which are effective in inducing estrus in postpartum anestrus cows (Pugashetti *et al*., 2009). Deficiency of minerals is also an important cause of anestrus in animals (Kumar *et al*., 2020[b]). This study was therefore designed to assess influence of different treatment protocols on hematological markers as well as on fertility response in true anestrus Sahiwal cows.

[1]Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[2]Department of Veterinary Physiology & Biochemistry, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

[3]Department of Instructional Livestock Farm complex, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India

Corresponding Author: Rajesh Kumar, Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science & Animal Husbandry, ANDUAT, Ayodhya, UP, India, e-mail: drrajesh25@gmail.com

How to cite this article: Husain, S., Kumar, R., Singh, B., Srivastava, S., Kumar, R., Kumar, P., & Srivastava, A. (2020). Influence of Different Therapy on Hematological Markers and Fertility Response in Anestrus Sahiwal Cows. Ind J Vet Sci and Biotech, 16(2,3,&4): 76-80.

Source of support: Nil

Conflict of interest: None.

Submitted: 25/07/2020 **Accepted:** 30/11/2020 **Published:** 25/12/2020

Materials and Methods

Selection of Experimental Animals

The study was carried out under farm conditions during the year 2019-20 in the semi-urban areas of Ayodhya district in

© The Author(s). 2020 Open Access This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

BREEDING VALUE ESTIMATION FOR LIFETIME IN SAHIWAL CATTLE AND CORRELATION STUDIES AMONG DIFFERENT METHODS

Jaswant Singh* , C.V. Singh, M.K. Verma and A.K. Srivastava
College of Veterinary Sciences and Animal Husbandry
Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad-224229 (UP)
*Part of the Ph.D.thesis submitted by the first author to the G.B.P.U.A. &T., Pantnagar

Abstract

The genetic worth of a sire can be measured directly but it has to be estimated either on the basis of phenotypic performance or observed value of a trait in the sire itself, or information from relatives in sex-limited traits such as milk yield.

The present investigation was undertaken on 1367 first lactation records of Sahiwal cattle maintained at GLF, Chak Ganjaria, Lucknow (U.P.) over a period of 71 years (1944-2014). The study was conducted on breeding value estimation of sires, relationship between Estimated Breeding Values (EBV's) for first lactation and life time traits using daughter's average, least-squares and best linear unbiased prediction methods of sire evaluation and effectiveness of these methods. The rank correlations among the breeding value of sires estimated from first lactation milk yield and life time milk were medium to high and highly significant (P<0.01). Therefore, the daughters of the sires selected on the basis of high first lactation milk yield would tend to produce higher life time milk yield. The product moment correlations among the estimated breeding value of the sires for first lactation traits by all the three methods ranged from medium to very high and highly significant (P<0.01) in all the three methods of sire evaluation.

Introduction

Cattle rearing has been an important source of livelihood in India and is closely associated with agricultural economy. The agriculture and allied sectors contribute nearly 14 per cent of the Gross Domestic Production. The agriculture and livestock are the main source of employment in rural areas and about 52 per cent of the population is engaged in agriculture and rearing of livestock in our country.

The effectiveness of sire evaluation is the backbone of any breed improvement programme. This investigation was planned to evaluate Sahiwal sires as its performance is remarkable in hot climate and has been recognized worldwide as one of the best milch breed (Hatsia et al., 2011). Various sire evaluation methods viz. daughter's average, least-squares analysis and best linear unbiased prediction (B.L.U.P.) were used to evaluate the sires and their effectiveness were compared for Sahiwal cattle. The information on the production of first lactation is mainly required for getting genetic improvement through selection, since it serves as an index of life time production in dairy cows. Therefore, it is very much essential for the sire evaluation to correlate the first lactation milk yield with life time milk production.

Materials and Methods

The data for the present investigation were collected over a period of 71 years (1944-2014) from pedigree sheet of 1367 Sahiwal cows born to 112 sires maintained at Government Livestock Farm, Chakganjaria, Lucknow (U.P.). Only the sires having the records on at least three or more daughters were included in the present study. The total duration of the present study was divided into 8 periods.

Out of 8 periods 7 are of 9 years each and 8th period of 8 years only. Each year was divided into three seasons namely winter (November-February), Summer (March- June) and Rainy (July- October). In order to classify the data for different periods and seasons year and season of calving was considered for all the traits.

Statistical Analysis

Rank correlation

After estimation of breeding value of sires, the sires were given rank as per their genetic merit. The Spearman's rank correlation between breeding values of sires derived by various methods was used to judge the effectiveness of different methods. The rank correlation was estimated as per methods developed by Steel and Torrie (1960).

$$r_s = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$

Where,

r = Rank correlation coefficient

n = Number of sires under evaluation

d_i = Difference of rank between paired items under two methods

The significance of rank correlation was tested by t-test as given below

$$t = r\frac{\sum(n-2)}{(1-r^2)}$$

It was compared with t-table value with (n-2) degree of freedom.

Simple product moment correlations

The simple correlations (r) between the estimated breeding values of bulls by different sire evaluation methods were also calculated by the following formula:

$$r_{(XY)} = \frac{Cov(XY)}{\sqrt{[Var\ (x)\ \ Var\ (Y)]}}$$

Where,

$$Cov\ (XY) = \sum XY - \frac{(\sum X)\ (\sum Y)}{n}$$

$$Var\ (X) = \sum X^2 - \frac{(\sum X)^2}{n}$$

$$Cov\ (Y) = \sum Y^2 - \frac{(\sum Y)^2}{n}$$

Where,

X, Y= The breeding value of sires estimated by two different methods

n= Number of pairs of breeding value

Rank correlation

The rank correlations of most efficient method (LSM) of sire evaluation for LTMY was statistically highly significant (P<0.01) with their values 1.00 ($\overline{D}$ and LSM), 0.71 ($\overline{D}$ and BLUP) and 0.71 (LSM and BLUP). For LTLL, the rank correlation between the different methods were 1.00 ($\overline{D}$ and LSM), 0.79 ($\overline{D}$ and BLUP) and 0.79 (LSM and BLUP). The rank correlation of estimated breeding values of LTMY between daughter's average and least squares method was very high (100%) (Table-1).

It revealed that ranking of sires for the estimated breeding value by daughter's average and least-squares method was similar while ranking of sires from BLUP was different. Similarly, for the LTLL, the rank correlation of estimated breeding values between ($\overline{D}$) and LSM was very high (100%). It revealed that ranking of sires for the estimated breeding value by $\overline{D}$ and LSM was similar while ranking of sires by BLUP was different.

Product moment correlation

The product moment correlations of most efficient method (LSM) of sire evaluation for LTMY with other two methods of sire evaluation (

An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

EFFECTOF DIFFERENT LITTER MATERIALS ON PRODUCTION PERFORMANCE OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[1],Gaurav Pandey[1], A.K.Srivastav[2] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.

College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstracts

The present study was conducted to investigate the effect of different litter materials on growth performance of Kadaknath chicks 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) co of two replicates in each treatment. The result showed that chicks reared on paddy straw + rice hulls litter had significantly hig weight, lower feed intake and better FCR($P<0.05$). The body weight of chicks raised under sand and rice hull litter did significantly, however the average daily feed intake of chicks under rice hulls was significantly higher than that of under sand performance index of the earlier study period was significantly higher in paddy straw + rice hulls followed by sand and r respectively.

Key words: Kadaknath, feed, body weight, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over those of exotic chickens (Dessie and Ogle, 2001).Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007).Various types of litter materials like sand (shields *et al.*, 2005), gypsum (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw(De Avila *et al.*, 2008) have been utilized as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse quality and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

To investigate the effect of litter material on the growth perf of kadaknath fowls

To study the feed conversion efficiency of kadaknath fow various bedding materials

Materials and Methods:

The present investigation was carried out to study the different litter materials on growth performance, feed gain Kadaknath fowl. The study was carried out at the poultry Teaching Livestock and Poultry farm of the College of V science and Animal Husbandry, N.D.U.A.T. Kumarganj, U.P., situated at a distance of 42 km away from Faizabad cit km away from Jagdishpur Industrial area at an altitude o above sea level and latitude of 26° 47' North and longitude East and it falls in Eastern plain Zone of Middle Gange region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of Nove February which comprised winter season of this region. Du period, the climatic parameters have been shown in table average minimum temperature recorded during study pe 12.54°C, while the average maximum temperature was There were a few showers of rain, ranging from 62 to 123 average was 92.5 cm during this period. The topography o almost even and most of the farm area remains dry round Parasitic infestation was moderate.

Climatological parameters recorded during experiment period

S.No	Climatological Parameters	Average Value	Average Max	Average Min
1.	Environmental temperature(°C)	18.7	24.86	12.54
2.	Relative humidity (%)	70.35	77.68	57.86

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath Chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group2(rice hulls), Group3(paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding an of Kadaknath Chicks in the brooder house. Brooding was pukka floor using deep litter system. Each group of Kadakna placed in separate pens which were visually isolated from e along with provision of adequate ventilation and artificial li brooder house.

Preparation of brooder house to receive Kadaknath chicl

Brooder house was properly scrubbed and cleaned at leas before the trail began. After the house, equipments were cleaned. The house was allowed to dry out thoroughly. The equipments were fumigated using 1% formalin. Three inches litter were made on the floor. Few days before the chicks equipments were arranged in brooder house and the elect were started to adjust temperature and light. The temperat the brooder house was slightly above 35°C. The corners of space were made rounded off with cardboard and metal chi to prevent chicks from piling up in the corner. All these pre

EFFECT OF DIFFERENT LITTER MATERIALS ON BEHAVIOR OF KADAKNATH FOWLS

Sachin Singh[1], P.S.Pramanik[1], A.K.Verma[2]*, M.K.Verma[3], K.D.Singh[3], Gaurav Panday[1], A.K.Srivastav[3] and R.K. Verma[4]

[1]Department of Livestock Production Management
[2] Department of Livestock Farm Complex
[3]Department of Animal Genetics and Breeding
[4]Department of T.V.C.C.
College of Veterinary Science and Animal Husbandry, N.D.U.A.T., Kumarganj, Faizabad, Uttar Pradesh- 224229 (India)

Abstract

The present study was conducted to investigate the effect of different litter materials on behavior of Kadaknath chicks. A total 300 Kadaknath chicks were raised on three litter treatments viz. Sand, rice hulls and rice hulls plus chopped paddy straw (1:1) comprising of two replicates in each treatment. The results indicate that Kadaknath chicks reared on sand and rice hull litter had significantly higher proportion of time in activities like drinking, dust-bathing and perching than paddy straw+rice hulls. The behavioral activities like drinking, dust bathing, stretching, standing and perching in sand litter, dust-bathing, peaking, stretching, walking, lying and perching in rice hulls and peaking, stretching and standing in straw+rice hulls were seemed to be significantly differed in morning, noon and evening hour interval.

Keywords: Kadaknath, feed, behavior, sand, rice hulls, litter materials

Introduction

Desi fowls are cheaply reared as scavenging flocks by feeding household left over and their meat and egg taste are preferred over that of exotic chickens (Dessie and Ogle, 2001). Wood shaving has been standard choice for poultry litter for many years. Rice hulls appear to be a favourable alternative to wood shavings (Grimes *et al.*, 2007). Various types of litter materials like sand (shields *et al.*, 2005), saw dust (Grimes *et al.*, 2007), rice and wheat straw (Sreehari Sharma 2010), ground corn cob and soyabean straw (De Avila *et al.*, 2008) have been utilised as bedding materials for rearing of poultry birds. Sand has shown good potential as an alternate litter for more reuse capacity and very less caking.

Pine shavings and saw dust are the most desirable and most widely used litter materials for broiler production in the United States. About 60% of farmers used saw dust as litter materials, 16.7% used wood shaving, 20% used both wood shaving and saw dust while 3.3% of farmers do not use bedding materials. The types of litter used by farmer depend on locality and availability (Kalu E. 2015) . Paddy husk is most commonly used litter material in northern India.Sigroha et al., (2017) used saw dust, wheat straw, rice husk, river bed sand and sandy soil as litter materials and found higher weight of birds at 42 days of age in wheat straw followed by sandy soil, saw dust, river bed sand and rice husk. As far as seen in literature there is no concert conclusion for litter type and thickness for various regions and climates. In view of above a study was undertaken with following objectives-

- To investigate the effect of litter material on the behavior of Kadaknath fowls

Materials and Methods

The present investigation was carried out to study the effect of different litter materials on growth performance, feed gain ratio of Kadaknath fowl. The study was carried out at the poultry unit of Teaching Livestock and Poultry farm of the College of Veterinary science and Animal Husbandry, N.D.U.A.T. Kumarganj, Faizabad U.P., situated at a distance of 42 km away from Faizabad city and 38 km away from Jagdishpur Industrial area at an altitude of 113 m above sea level and latitude of 26° 47' North and longitude of 82° 12' East and it falls in Eastern plain Zone of Middle Gangetic Plain region of India.

Experimental period and climatic conditions

The experiment was conducted in the months of November to February which comprised winter season of this region. The average minimum temperature recorded during study period was 12.54°C, while the average maximum temperature was 24.86°C. There were a few showers of rain, ranging from 62 to 123 cm and average was 92.5 cm during this period. The topography of land is almost even and most of the farm area remains dry round the year. Parasitic infestation was moderate.

Experimental animals

To carry out present investigation, 300 straight run day old Kadaknath chicks, from college hatchery were got issued. These 300 kadaknath chicks were divided into two batches; each batch consisted of 150 Kadaknath Chicks. Each batch was subdivided in three equal groups of 50 chicks viz. Group1 (sand), Group 2(rice hulls), Group3 (paddy straw + rice hulls) randomly distributed among three pens. Each pen was equipped with fresh litter, feeder and waterer. All the birds were raised on pukka floor with sand, rice hulls and paddy straw + rice hulls (50:50) as litter materials. Chicks were reared under standard uniform managemental practices up to the age of 42 days and observations for different parameters were recorded simultaneously. Thereafter, a replication was made with the next batch of chicks.

Brooding and rearing of chick

Brooder house

The cold room brooding method was applied for brooding and rearing of Kadaknath Chicks in the brooder house. Brooding was done on pukka floor using deep litter system. Each group of Kadaknath chicks placed in separate pens which were visually isolated from each other along with provision of adequate ventilation and artificial light in the brooder house.

Preparation of brooder house to receive Kadaknath chicks

Brooder house was properly scrubbed and cleaned at least a week before the trail began. After the house, equipments were properly cleaned. The house was allowed to dry out thoroughly. The house and equipments were fumigated using 1% formalin. Three inches depth of litter were made on the floor. Few days before the chicks arrived, equipments were arranged in brooder house and the electric bulbs were started to adjust temperature and light. The temperature under the brooder house was slightly above 35°C. The corners of brooding space were made rounded off with cardboard and metal chick guards to prevent chicks from piling up in the corner. All these preparations were completed for Kadaknath chicks before they were procured to brooder house. A chick guard of about 15 cm height was used at a distance of 30 to 40 cm away from the brooder and was moved away for the every day. It was completely removed after two weeks.

Litter materials

For the present experiment three litter materials namely sand, rice hulls and paddy straw + rice hulls (50:50) were used for rearing the Kadaknath chicks. Rice hulls were procured from the nearby rice mill, paddy straw taken from village shivnathpur and sand was taken from kumarganj market. These litters were clean, dry and free from fungal growth. The thickness of litter was 3.0 cm. After spreading this litter on the floor with proper thickness was covered with newspaper up to 4 days of brooding.

Parameters recorded

Behaviour

The behaviours in the Kadaknath recorded in this study were chosen from preliminary observations and defined as a list of 12 states which have given here.

1. Eating
2. Drinking

...reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

STUDY THE PHYSIO-HEMATOLOGICAL RESPONSE BEFORE AND AFTER DISBUDDING IN CALVES

Shiv Swaroop[1], P.S. Pramanik[1], K.D. Singh[2*], A.K. Verma[2], Vishuddha Nand[2] and A.K. Srivastav[1]

[1]Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India [2]Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry NDUAT, Kumarganj, Faizabad- 224229, Uttar Pradesh, India

Abstract

The aim of the present investigation was to examine the effect on Physio-haematological profile before and after disbudding in calves. The study was carried out at Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and nearby villages. Twenty four cattle calves were utilized to study Physio-haematological parameters that are Respiration Rate (RR), Pulse Rate (PR), Rectal Temperature (RT), Haemoglobin (Hb (gm/dl), Neutrophil (%), Basophil (%), PCV (%), Lymphocyte (%), Monocyte (%), TLC (10^3/ µl), Eosinophil (%) and N:L ratio) before and after disbudding in to four groups viz. control (T_0), lignocaine (T_L), tramadol (T_T) and lignocaine+tramadol (T_{L-T}). After medication calves were disbudded by hot iron method. The physiological parameters recorded just before (0h) and after disbudding on 1h, 6h and 24h. The blood samples were collected for haematological parameters just before (0h) and after disbudding on 6h, 24h and 72h. The results showed that, at 0h, 1h, 6h and 24h RR were significantly different among treatment groups. Only at 0h PR was significantly different among different treatment groups and during rest of the period up to 24h there is no significant different among groups. There was significant difference for RT only at 24h among different treatment groups. At 24h, T_0 group showed significantly lowest Hb (10.66±0.49%) which was statistically similar to T_T and T_{L-T} groups. At 0h, 6h and 72h means of PCV% were significantly different among treatment groups. There was no significant different in eosinophil, neutrophil and TLC among different treatment groups during the whole period of study. The lowest lymphocytes (64.00±1.00) was observed in T_T group at 6h. The T_0 group showed significantly lowest basophil (0.00±0.00) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group at 6h. At the same interval, T_0 group showed significantly lowest monocytes (4.66±0.61) which was significantly different with T_L T_T and T_{L-T} groups. At 6h, T_0 group showed significantly lowest N/ L ratio (0.15±0.01) which was statistically similar to T_T and T_{L-T} groups but significantly different from T_L group. It may be concluded that generally physiological responses like RR, PR and RT were higher in control groups than treatment groups before and after disbudding. No significant difference was observed in eosinophil%, TLC, neutrophil% and monocyte% counts between control and treatment groups. However Hb%, basophil%, PCV% and lymphocyte% were significantly different between control and treatment groups. N/L ratio was significant only at 6h. Most of the cases T_{L-T} group showed comparatively better performance.

Introduction

Disbudding is painful yet common husbandry practice in the cattle industry, especially on dairy farms, because horniess cattle are safer (ALCASDE, 2009) and injuries to cattle and other animals are reduced (Prayaga, 2007). Dehorned cattle are safer to handle and cause fewer injuries to workers, other cattle, and farm animals (Stafford and Mellor, 2005). Cattle are also dehorned to reduce bruising and hide damage and to meet transport requirements (Gooneweardene and Hand, 1991; Faulkner and Weary, 2000; Prayaga, 2007). Several disbudding methods exist, including cautery, the use of caustic paste, and hot iron. All of these methods involve tissue damage and have been described as painful (Stafford and Mellor, 2005; 2011). The *Model Code of Practice for the Welfare of Animals: Cattle*, however, strongly advises against caustic disbudding (PISC, 2004).

Despite this knowledge, dehorning is commonly performed without pain relief because of the costs and impracticalities associated with researched methods (Petherick, 2005). The breeding of polled cattle eliminates the need for dehorning and because horns are inherited as an autosomal recessive with polledness being dominant (Long and Gregory, 1978), The legislation pertaining to dehorning and disbudding differ between countries like in Sweden, disbudding without local anaesthesia and sedation was banned in the 1992 Animal Rights Act (Bengtsson *et al.* 1996), but calves may be dehorned in Denmark without local anaesthesia until they are 4 weeks of age (Grondahl-Nielsen *et al.* 1999). The Council of Europe recommends the use of anesthesia for the dehorning of calves over 4 wk of age (Oliver, 2009). Pain control is also required for all calves under the *Canadian Code of Practice for the Care and Handling of Dairy* Cattle (NFACC, 2009). Furthermore, the Australian *Model Code of Practice for the Welfare of Animals: Cattle* recommends the use of local analgesics for dehorning calves over 6 month of age (PISC, 2004). Thus, the need to meet industry standards and the availability of suitable dehorning pain relief regimens for commercial production remain a challenge. Very little work has been done on the disbudding distress in Indian dairy animals particularly in indigenous animals.

Materials and Methods

The aim of the present investigation was to examine the Physio-hematological response before and after disbudding in calves. Study was carried out at the Instructional Livestock Farm Complex of the college of Veterinary Science and Animal Husbandry, NDUAT, Kumarganj, Faizabad and around the campus. Twenty four (24) farm born cattle calves of 2 to 3 weeks were randomly divided into four groups within each comprising of 3 males and 3 females, Control (T_0), Lignocaine hydrochloride (2%) @ 1 ml/ bud (T_L) (Tramadol @ 0.25 mg/ kg body weight I/M) (T_T) and Lignocaine + Tramadol at above dose rate (T_{L-T}). Medication was done 5-10 minutes before disbudding. Two doses of ligocaine per bud were injected for corneal nerve block in calves.

(a) Physiological responses

Physiological responses recorded before and after disbudding were as follows-

Respiration rate (no./ minutes)	Pulse rate (no./ minutes)	Body temperature (°F)

(b) Haematological parameters

Haematological responses recorded before and after disbudding were as follows

a) Hb (gm/dl)	d) Neutrophil (%)	g) Basophil (%)
b) PCV (%)	e) Lymphocyte (%)	h) Monocyte (%)

Biological Forum – An International Journal 14(3): 240-244(2022)

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Socio-economic Profile of the Poultry Farmers of Contract and Non- contract Broiler Farming in Eastern Plain Zone of Uttar Pradesh

Mustak Ahamad[1], H.C. Verma[2], R.K. Singh[2], Subodh Kumar[3], R.P. Diwakar[4] and Amit Kumar[1]*

[1]*Ph.D. Scholar of Veterinary and Animal Husbandry Extension Education, College of Veterinary Science & AH, ANDUAT, Ayodhya (Uttar Pradesh), India.*
[2]*Department of Veterinary and Animal Husbandry Extension Education, College of Veterinary Science & AH, ANDUAT, Ayodhya (Uttar Pradesh), India.*
[3]*Department of Livestock Farm Complex, College of Veterinary Science & AH, ANDUAT, Ayodhya (Uttar Pradesh), India.*
[4]*Department of Veterinary Microbiology, College of Veterinary Science & AH, ANDUAT, Ayodhya (Uttar Pradesh), India.*

(Corresponding author: H.C. Verma)*
(Received 02 May 2022, Accepted 02 July, 2022)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The present study was carried out by research scholar of department of veterinary & A.H. extension education, ANDUAT, Kumarganj, and Ayodhya in the eastern plain zone of Uttar Pradesh. The state was purposively selected because, broiler farming in Uttar Pradesh as already discussed is in developing stage as compared to southern, western and other north Indian states like Punjab, Haryana etc. There is a substantial gap in demand and supply of poultry meat and table eggs. Uttar Pradesh being the most populous state and having large population engaged in both contract and non contract broiler poultry production. The Eastern Plain Zone was selected purposively due to highest poultry population among all other zones. The Eastern Plain Zone comprises of 12 districts namely Ambedkar nagar, Azamgarh, Ballia, Barabanki, Chandauli, Faizabad, Ghazipur, Jaunpur, Mau, Sant Ravidas Nagar, Sultanpur and Varanasi. For the present study, three districts viz. Sultanpur, Amethi and Pratpagarh were selected purposively out of 12 districts, on the basis of poultry population. Two District Ambedkarnagar and Sultanpur were selected from eastern plain zone of Uttar Pradesh, purposively on the basis of poultry population and intensity of contract broiler farmers. From each block, two lists, one of contract broiler farmers and other of non-contract broiler fanners were prepared, from each list 20 contract and 20 non-contract poultry farmers having at least 2000 birds and two years of experience in poultry farming were selected randomly. Thus from each block 40 farmers (20 contract and 20 non-contract) were selected which make the total sample size of 160 broiler farmers (80 contract and 80 non-contract). Majority of the respondents (56.25%) were belonging to middle age category followed by young age (23.75) and old age (20.00) respectively. Maximum percentage (46.25%) of contract broiler farmers belonged to OBC caste followed by general (32.50%). Overall, 61.25 per cent of the broiler farmers in the study area were Hindu, followed by Muslim (38.75%). Majority (51.25%) of the contract broiler farmers belonged to nuclear family type, followed by joint family (48.75%). The result of socio-economic status like Age, education, family type, family size, experience, occupation of poultry farmer play important role in rate adoption and get more economy of poultry farmers in contract and non-contract pattern of broiler poultry farming.

Keywords: Socio-economic profile, Poultry farmers, Contract farming, Non-contract farming.

INTRODUCTION

Broiler poultry farming plays an effective role in improving the economic status of the rural poultry farmers by increasing their socioeconomic condition besides providing nutritious food through meat. There is regional variation in poultry production like contract and non-contract patter of poultry farming in India Poultry is one of the fastest growing segments of the agricultural sector in India today. During the 2013–14 fiscal years, the nation exported 4.3 million metric tons of poultry products to the rest of the world for a total of Rs. 565.87 crores (APEDA, 2013). Broiler farming plays an effective role in improving the economic status of the rural people by increasing their income besides providing nutritious food through meat. There is regional variation in poultry production in India. The northern region is lagging behind as compared to southern and with in northern region. In northern region UP has poor performance as compared to Haryana and Punjab. The total Poultry in the country is 851.81 Million in 2019, increased by 16.8% over previous Census. The total Backyard Poultry in the country is 317.07 Million in 2019, increased by 45.8% over previous Census. The total Commercial Poultry in the country is 534.74 Million in 2019, increased by 4.5% over previous Census. According to estimates, in India,

VOL. XII, ISSUE XXXIII, JULY 2022 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal for Applied science

ADOPTION LEVEL OF SCIENTIFIC BROILER FARMING PRACTICES AMONG CONTRACT ANDNON-CONTRACT BROILER FARMERS IN EASTERN PLAIN ZONE OF UTTAR PRADESH

Mustak Ahamad[1], R.K. Singh[1], H.C. Verma[1*], Subodh Kumar[2], Amit Singh[3], and P.S. Parmanic[4]
[1]Ph.D. scholar of Veterinary and Animal Husbandry Extension Education
[1]Department of Veterinary and Animal Husbandry Extension Education,
[2]Department of Livestock farm complex,
[3]Department of Veterinary Parasitology,
[4]Livestock production and Management
College of Veterinary Science & AH, ANDUAT, Ayodhya, UP-224229, India
drhukumchandraverma@gmail.com

MS 2887 (MS Received: 22.05.2022; MS Revised: 29.06.2021; MS Accepted: 30.06.2022)
(RESEARCH PAPER IN VETERINARY AND ANIMAL HUSBANDRY,)

Abstract

A study was carried out at ANDUAT, Kumarganj, Ayodhya in the eastern plain zone of Uttar Pradesh. The Eastern Plain Zone was selected purposively due to highest poultry population among all other zones. The Eastern Plain Zone comprises of 12 districts namely Ambedkar nagar, Azamgarh, Ballia, Barabanki, Chandauli, Faizabad, Ghazipur, Jaunpur, Mau, Sant Ravidas Nagar, Sultanpur and Varanasi. The state was purposively selected because, broiler farming in Uttar Pradesh as already discussed is in developing stage as compared to southern, western and other north Indian states like Punjab, Haryana etc. There is a substantial gap in demand and supply of poultry meat and table eggs. Uttar Pradesh being the most populous state and having large Muslim population has huge potential for growth of poultry sector. So in this context two districts Ambedkarnagar and Sultanpur were selected from eastern plain zone of Uttar Pradesh, purposively on the basis of poultry population and intensity of contract and non-contract broiler farmers. Two block was selected from each district and from each block, two lists, one contract broiler farmers and other of non-contract broiler fanners were prepared. From each list 20 contract and 20 non-contract poultry farmers having at least 2000 birds and minimum two years of experience in poultry farming were selected randomly. Thus from each block 40 farmers (20 contract and 20 non-contract) were selected which make the total sample size of 160 broiler farmers (80 contract and 80 non-contract). Majority (58.75%) of the broiler farmers had medium level of adoption of housing management practices, followed by low (28.75%) and high (12.50%) level. Majority (55.00%) had medium level of adoption of brooding management practices. Majority (51.88%) of the broiler farmers had medium level of adoption of health care management practices, followed by low (29.37%) and high level (18.75%). While majority of contract and non-contract broiler farmers (50.00% & 53.75%) had medium level of adoption of health care management practices, followed by low (26.25 and 32.50%) and high (23.75 and 13.75%) level, respectively.

Key words: *Adoption level, Broiler farming, Contract farming and non-contract farming, Eastern plain Zone*

Introduction

Broiler farming plays an effective role in improving the economic status of the rural poultry farmers by increasing their income besides providing nutritious food through meat. There is regional variation in poultry production like contract and non-contract patter of poultry farming in India. The northern region is lagging behind as compared to southern and with in northern region. In northern region UP has poor performance as compared to Haryana and Punjab. The total poultry in the country is 851.81 Million in 2019, increased by 16.8% over previous Census. The total Backyard Poultry in the country is 317.07 Million in 2019, increased by 45.8% over previous Census. The total Commercial Poultry in the country is 534.74 Million in 2019, increased by 4.5% over previous Census. According to estimates, in India, a vertically integrated system produced 90% of the poultry in the Southern region, 80% in the Western region, 70% in the Eastern region, and 10% in the Northern region (Rajan 2006). Poultry is one of the fastest growing segments of the agricultural sector in India today. During the 2013–14 fiscal years, the nation exported 4.3 million metric tons of poultry products to the rest of the world for a total of Rs. 565.87 crores. (APEDA, 2013). The economic status also affect rate adoption of poultry farmers in contract and non-contract pattern of broiler farming. Good economic status have higher rate of adoption of scientific broiler farming like housing, brooding, feeding and health care management. **Materials And Methods**

The Eastern Plain Zone was selected purposively due to highest poultry population among all other zones. The Eastern Plain Zone comprises of 12 districts namely Ambedkar nagar, Azamgarh, Ballia, Barabanki, Chandauli, Faizabad, Ghazipur, Jaunpur, Mau, Sant Ravidas Nagar, Sultanpur and Varanasi. For the present study, three districts viz. Sultanpur, Amethi and Pratpagarh were selected purposively out of 12 districts, on the basis of poultry population. So in this context two districts Ambedkarnagar and Sultanpur were selected from eastern plain zone of Uttar Pradesh, purposively on the basis of poultry population and intensity of contract and non-contract broiler farmers. Two blocks was selected from each district and from each block, two lists, one contract broiler farmers and other of non-contract broiler framers was prepared. From each list 20 contract and 20 non-contract poultry farmers having at least 2000 birds and minimum two years of experience in poultry farming were selected randomly. Thus from each block 40 farmers (20 contract and 20 non-contract) were selected which make the total sample size of 160 broiler farmers (80 contract and 80 non-contract).

Results And Discusion

The adoption of scientific broiler farming practices was studied with respect to housing,brooding, and feeding and health care management practices. The results are presented in followingtable

Housing Management Practices:

Table 1.1 Distribution of poultry farmer Adoption level of contract and non-contract broiler farmers with respect to housing management practices:

Adoption level	N.C.B.F. (n=80)		C.B.F. (n=80)		Pooled (N=160)	
	f	%	f	%	f	%
Low (up to 1)	27	33.75	19	23.75	46	28.75
Medium (2 to 3)	45	56.25	49	61.25	94	58.75
High (above 4)	8	10.00	12	15.00	20	12.50
Mean ± SD	1.53 ± 0.67		1.6 ± 0.66		1.75 ± 0.65	
t-test value			3.16**			

(296)

Int.J.Curr.Microbiol.App.Sci (2021) 10(02): 3078-3084

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 Volume 10 Number 02 (2021)
Journal homepage: http://www.ijcmas.com

Original Research Article

https://doi.org/10.20546/ijcmas.2021.1002.356

Level of Participation of Women and Men Members in Dairy Husbandry

Tankit Kumar[1], Subodh Kumar[2] and Krishna Kant[2]

[1]Department of Extension & Communication Management, College of Home Science, [2]ILFC, College of Veterinary Science and Animal Husbandry, PhD Scholar Department of Agricultural economics in NDUAT Kumarganj Ayodhya, India

**Corresponding author*

ABSTRACT

India is a developing country. Agriculture and livestock husbandry plays crucial role in Indian rural economy. Dairy husbandry is an integral part of rural livelihood adopted as income generating activity by majority of the rural people. Women play a significant role in dairy development, even after many custom discriminations against them. Entrepreneurial attributes of one's personality indicate the success of an enterprise managed by individual. With this background an attempt have been made to study level of participation of women and men members in dairy husbandry practices, Milkipur block of Faizabad District in Uttar Pradesh, India. For the purpose multistage sample and single random sampling designs were applied and 100 dairy cooperative members (50 men and 50 women) were interviewed with the help of structured and pre-tested interview schedule. Ten entrepreneurial attributes were studied and its relationship with income generated through dairy husbandry was also confuted. The Overall Participation in dairy farming activities, the majority of male milk cooperative members in medium category (52%). Likewise, in case of female milk cooperative members majority in medium category (76%). Thus, it may be concluded that the female milk cooperative members were found better as compared to male milk cooperative members in Overall Participation in dairy farming activities. Focused that out of twenty-one selected independent variables, only five variables i.e. extension contact, entrepreneurial behavior, milk production, milk consumption and milk marketed were found highly significantly ($P \leq 0.01$) and positively correlated with the income through dairy cooperative. That is out of twenty-one selected independent variables, only four variables i.e. Social Participation, Participation in Health care, milk production and milk consumption were found significantly ($P \leq 0.05$) and positively correlated with the employment through dairy cooperative. The both dependent variables income generation and employment generation are positively and significantly ($P \leq 0.05$) correlated with each other.

Keywords

Participation, Entrepreneurship, Milk cooperative societies, Dairy husbandry, Gender, women, Men

Article Info

Accepted:
22 January 2021
Available Online:
10 February 2021

Introduction

India is a vast country with diversified agro-climatic conditions. Agriculture is the main occupation in the country; majority of population still dependent on agriculture and allied sector. Most of the farmers are engaged in agricultural operations for about 8-9

The Pharma Innovation Journal 2021; SP-10(6): 210-214
www.ThePharmaJournal.com
The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(6): 210-214
© 2021 TPI
www.thepharmajournal.com
Received: 01-04-2021
Accepted: 03-05-2021

KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

PS Pramanik
Department of Livestock Production Management, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Subodh Kumar
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Rajesh Kumar
Department of Veterinary Gynaecology & Obstetrics, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

AK Srivastav
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

MK Verma
Department of Veterinary Pharmacology & Toxicology, College of Veterinary Science and Animal sciences, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author:
KD Singh
Department of Livestock Farm Complex, College of Veterinary Science and Animal Husbandry ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Impact of stocking density on gait score and mortality in broiler chickens

KD Singh, PS Pramanik, Subodh Kumar, Rajesh Kumar, AK Srivastav and MK Verma

Abstract
The research was conducted to investigate the impact of stocking density (i.e., I.C.A.R., Venky·s and Amrit recommendations) on gait score & mortality in broiler chickens. A 500 day-old straight run commercial broiler strain "VENCOB" chicks were divided in two batches. Each batch was subdivided in 3 equal groups namely Gr 1 (I.C.A.R.), Gr 2 (Venky·s) and Gr 3 (Amrit). All the birds were raised on pucca floor with saw dust as litter material providing equal managemental practices. Walking ability was accessed at weekly interval up to 6 weeks of observation. The gait scoring system followed in the present study was Modified gait scoring system developed by Garner *et al.* (2002). Daily mortality of birds was recorded in morning hours &mortality rate was calculated weekly. The lowest and highest% of birds showing GS 0 under I.C.A.R. recommendation of stocking density have been found to be 83.93±0.64% (week 4) and 92.86±0.40% (week 6) respectively. Similarly the corresponding proportion of birds showing GS 1 were 6.07±0.78% (week 1) and 13.93±0.64% (week 4) respectively. Comparatively lesser % of birds show GS 2 and the lowest and highest L.S. means % of this were 0.00±0.40% (week 6) and 3.21±0.82% (week 3) respectively. Venky's & Amrit's observation were also similar as I.C.A.R. recommendation has been observed. Overall it has been observed that% of birds showing GS 0 was significantly more in I.C.A.R. followed by Amrit and Venky's during this study. However, highest% of birds showing GS 1 was recorded in Venky's recommendation followed by Amrit and I.C.A.R. Whereas, less than 5% birds exhibited GS 2 in this study in respective of stocking densities. There was no significant difference regarding% of birds with GS 2 in three stocking densities during all the weeks except at week 4. The overall mortality (%) was less than 5% over weeks under each placement densities. No significant difference was observed among mortality rates of broiler chickens under these three stocking densities during all the weeks studied. From present study, this can be concluded that leg health and walking ability was comparatively better under I.C.A.R. recommendation followed by Amrit and Venky's. However, effect of stocking density on mortality was non significant among three stocking

Keywords: gait score, foot pad lesions, stocking density, mortality and walking ability

Introduction
The total poultry population in India is 729.2 million, which is 12.39 percent higher than numbers in the previous census (Livestock Census, 2012) [21]. Poultry is one of the fastest growing sectors of Indian agriculture today, with annual growth rates of 5.57 percent and 11.44 percent in egg and broiler production, respectively. The value of output from the poultry sector was US$10 billion in 2014 (Rajendran *et al.*, 2014) [25]. Broiler production has been more vibrant than layer production within the poultry sector, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (Index Mundi, 2015) [15]. India is the fourth largest producer of poultry meat in the world, valued at US$ 6.6 billion. Poultry production accounts for about 0.66 percent of India's GDP and 7.72 percent GDP from the livestock sector (Rajendran *et al.*, 2014) [25]. Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014. The per capita availability of poultry meat is 2.8 kg; against recommended level of 11 kg (Rajendran *et al.* 2014 [25]; Index Mundi, 2015 [15]). The main reasons for improved broiler poultry production (Kalamkar, 2012; SAPPLPP, 2009) [17, 29] are: modernization of production practices; import o pure lines/grandparent stock; least-cost feed formulation; vaccines against major diseases provision of EAS and other input services; improved quality breeder management developments in poultry processing; and private sector partnerships through Contract Broil Farming. It is estimated that 37 percent of broiler production in India is under contracts, an about 78 percent of those contracts are concentrated in southern India (Rajiajwani, 2012) [26]. Gait scores (GS), a parameter used to evaluate walking ability (Kestin *et al.*, 1992; Garner *et*

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

MORTALITY PATTERN OF LAYERS IN AN ORGANIZED POULTRY FARM

[1]L.C. Verma, [2]Shrikant Katole [3]R.P.K. Singh, [1]R. K. Singh [4]Subodh Kumar
[1]SMS/Associate Professor, KVK, Azamgarh, NDUAT, Ayodhya-224229, U.P., India
[2]Farm Manager, K.V.K., Azamgarh, NDUA&T Kumarganj Ayodhya-224229, UP India
[4]Associate Professor, NDUA&T Kumarganj Ayodhya-224229, UP India
[3]Agricultural University, Anand-388110, Gujarat, India.

Abstract

The present study was carried out in layer birds maintained at farmer field of Azamgarh under supervision of Krishi Vigyan Kendra, Kotwa, Azamgarh, (NDUAT, Kumarganj, Ayodhya) Uttar Pradesh spread over 3 years (2015-16 to 2016-17 and 2017-18). Causative agents were listed and per cent mortality was calculated during different seasons. There are four seasons, viz. winter, summer, southwest monsoon and northeast monsoon. Brooder and grower layer (0-20 weeks) and adult layer (21-68 weeks) were reared in deep litter/cage system of management. The overall mortality pattern during brooder and grower period (0-20 weeks) revealed that in southwest monsoon the mortality was the highest (53.32 %), followed by 26.22 % during summer, 14.33% in northeast monsoon and the lowest (6.11%) in winter. The overall mortality due to omphalitis was high (29.24%) and significantly (P<0.05) influenced by season. Colibacillosis, hepatitis and chicken pox incidences were also significantly (P<0.05) influenced by season and the overall per cent mortality incidences were 19.46, 17.04 and 6.09 respectively. Debility and non specific causes for mortality were 14.61 and 13.26 per cent respectively. The causes of mortality in layer chicken observed were hepatitis (40.56 %), Staphylococcal infection (18.56%), pneumonia (6.21%) and non specific (34.66%) in that order from high to low. The mortality during laying period due to hepatitis was higher during winter (66.66%) and southwest monsoon (45.00%). The incidences of pneumonia and Staphylococcal infections were observed only in monsoon.

Keywords: Layer chicken, Mortality Pattern, Season.

Introduction

The layer chicken (*Gallus domesticus*) a well known bird in western countries, is yet to be established on commercial point of view in the rest of the world especially in developing countries. Commercial layer farming is becoming popular in India and farmers started to show interest in rearing layer birds. The bird is quite suitable for socio-economical improvement of small and marginal farmers as it can be easily reared with little investment for housing, equipment and management. Since the economy of the poultry farm depends on livability of birds, the mortality records in a poultry farm are of immense importance to know the prevalence of diseases and for adopting preventive and control measures (Buragohain and Kalita, 2010). Information regarding mortality pattern of layers and the causes under local condition of Eastern Uttar Pradesh (Purwanchal) is inadequate. Considering the importance of proper documentation of layer diseases, which help in the analysis of occurrence of the diseases and finding out the etiological agent for taking appropriate disease control measures, the study was undertaken to assess the causes and pattern of mortality in layers under sub-tropical humid climate of Azamgarh.

Materials and Methods

The present study was carried out in layer chicken maintained at farmer fields of district Azamgarh under supervision of Krishi Vigyan Kendra, Kotwa, Azamgarh affiliated with NDUAT, Kumarganj, Ayodhya, Uttar Pradesh spread over 3 years (2015-16 to 2016-17 and 2017-18). Causative agents were listed and per cent mortality was calculated during different seasons. The four seasons of Azamgarh district are, winter (December, January and February), summer (March, April and May), southwest monsoon (June, July and August) and northeast monsoon (September, October and November). Layers were reared under deep litter/cage system and standard managemental conditions.

Brooder and grower poultry (0-20 weeks of age) and layer poultry (21-68 weeks of age) were reared in deep litter system. Mortality was recorded throughout the rearing period and post-mortem examination of all the 650 birds died was done. The data were analysed as per standard statistical procedure described by Snedecor and Cochran (1994).

Results and Discussion

Brooder and grower mortality (0-20 weeks of age)

The incidence of brooder and grower mortality is presented in Table.1. The overall mortality pattern during brooder and grower period (0-20 weeks) revealed that in southwest monsoon the mortality was the highest (53.32%), followed by 26.22 % during summer, 14.33 % in northeast monsoon and in winter the lowest (6.11 %). Apart from this, 22.39 per cent of mortality observed in summer may be due to stressors like high temperature with high humidity during which predispose bacterial, parasitic and other diseases. Behera *et al.* (2012) reported an overall brooding mortality in broiler chicken as 64, 24.5 and 11 per cent in summer, winter and rainy seasons respectively.

In the present study, mortality in brooder and grower was attributed to omphalitis, colibacillosis, hepatitis, debility, non-specific causes and chicken pox in that order from high to low. The highest mortality due to omphalitis was observed in summer (43.33 %) followed by winter (28.57%), southwest monsoon (26.55 %) and lowest in northeast monsoon (18.51 %) season. Highest mortality incidence due to omphalitis in summer followed by winter might be the reason of bacterial contamination such as E.Coli, staphylococcus, streptococcus and proteus contamination, which will be predominant in summer as well as winter. Terregino *et al.* (2000) found that the commonest causes of mortality in chicken at the first week were omphalitis, yolk sac infection and septicemia. Sharma *et al.* (2005) reported higher deaths due to omphalitis, weaklings, colibacillosis and pneumonia during first week in broilers. The incidence of colibacillosis in brooder and grower period in different season ranged from a low 6.09 % during northeast monsoon and a high 33.33 % during summer. The season had significant (P<0.01) influence on the incidence of colibacillosis. More incidences of colobacillosis in summer might be the reason of low water level leads to contamination. Hepatitis incidence was also influenced significantly (P<0.01) by season in this study up to 20 weeks of age with the value ranging from a low 2.29 % in southwest monsoon to a high 39.02% in northeast monsoon. Feed toxicity due to high humidity in monsoon season might be a possible reason. Incidence of chicken pox mortality (24.39%) was observed only in northeast monsoon. Debility and non-specific causes were found to be significantly (P<0.05) higher in southwest monsoon (23.60 % and 26.22 % respectively) and lower (4.87% and 6.09% respectively) in northeast monsoon.

Layer mortality (21-68 weeks of age)

The incidence of layer poultry mortality is presented in Table.2. The causes of mortality observed were hepatitis, nonspecific causes, Staphylococcal infection and pneumonia in that order from high to low in winter and southwest monsoon. The overall mortality pattern during laying period (21-68 weeks) revealed that in winter the mortality was the highest (38.46 %), followed by 25.64 % during southwest monsoon, 23.07 % in northeast monsoon and in summer the lowest (12.82 %). The overall mean mortality of 42.35% due to hepatitis was observed with a low incidence of 27.77 % in northeast monsoon and

International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 12, 2018, pp.-6368-6372.
Available online at https://www.bioinfopublication.org/jouarchive.php?opt=&jouid=BPJ0000217

Research Article

SOCIO-ECONOMIC PROFILE OF THE DAIRY FARMERS IN SULTANPUR DISTRICT OF UTTAR PRADESH

Sanjeev Atreya*[1], Prakash Singh[1], Subodh Kumar[2], Manoj Kumar[1], Kaushik Prasad[1] and Kamal Kishore[1]
[1]Department of Extension Education, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh, India
[2]Department of Veterinary & Animal Husbandry Extension, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, 224229, Uttar Pradesh, India
*Corresponding Author: Email- sanjeevatrey365@gmail.com

Received: June 04, 2018; Revised: June 21, 2018; Accepted: June 22, 2018; Published: June 30, 2018

Abstract: This study was conducted in Sultanpur district purposively selected because in this district there is highest milk production among all the entire district in Faizabad commissionery (U.P.). There are a total number of 69 milk cooperative societies under cooperative milk union Sultanpur district. These cooperative societies will be arranged in descending order according to the total milk collection at each cooperative society. From the list of cooperative societies, 10 milk cooperative societies having highest milk collection will be selected purposely. The list of member dairy farmers will be prepared from the selected milk cooperative society. From the list 10 members dairy farmers from each of the selected society would be selected randomly. So 100 members dairy farmers and non member dairy farmers would be identified thus a total of 200 dairy farmers will be the sample size for the study reveals that in case of Member dairy farmers in district Sultanpur dairy farmer, the maximum number of respondents58% were found in (32-82) of age group, like this 15 % literate, 73% other backward caste, 74% nuclear family, 62% medium family size (5-11 members), 93% marginal land holding size (less than 1 ha.), 36% agriculture occupation, 63% low categories annual income (up to 87165 Rs), 33% pucca houses, 72% in middle categories overall material possession (13 to 37 equipment), respectively. Likewise, in case of non member of dairy farmers, the majority of the respondents 59% were found in (32-61) of age group, like this 14 % literate, 65% other backward caste, 69% nuclear family, 79% medium family size (5-11 members), 98% marginal land holding size (less than 1 ha.), 37% agriculture occupation, 56% low categories annual income (up to 87165 Rs), 40% pucca houses, 62% in middle categories overall material possession (13 to 37 equipment), respectively.

Keywords: *Socio-economic profile, Dairy farmers, Schedule, Resource*

Citation: Sanjeev Atreya, *et al.*, (2018) Socio-economic profile of the Dairy Farmers in Sultanpur district of Uttar Pradesh. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 10, Issue 12, pp.- 6368-6372.

Copyright: Copyright©2018 Sanjeev Atreya, *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

Livestock rearing are believed to be the first step of the primitive man toward civilization. Livestock has played a crucial role in the development and progress of mankind. They have provided human beings with food, energy, clothing and nutrition besides helping in transport and agricultural activities. They have also been mute companions to humans. Today, livestock rearing is not only a subsidiary source of income but. It provides livelihood insurance during extreme climatic conditions like drought flood etc. also. Being a predominantly agricultural economy, India has the one of the lives to cooperation largest population in the world. Presently, the livestock sector accounts for about 21 percent of the value of output of the combined crops and livestock sectors which constitute agriculture. This in turn is about 29 percent the total Gross Domestic Product (GDP) of the economy. In India more than 70 percent of the human population in villages depends on agriculture, animal husbandry and allied activities for their livelihood. Among many livestock enterprises, dairying is the most ancient occupation that established well in rural setting of the country. The dairying requires a lot of skilled and unskilled manual labor for its various kinds of activities like maintenance of animal, feeding, milking, cleaning of cattle sheds, taking care of calves, processing of milk and marketing etc. Thus, the employment potential is higher in dairy sector. Our country bears a rich tradition in dairying since the time of lord Krishna. Dairying has been inherent in Indian culture for centuries. Growing private investment in dairy processing facilities are also expected to provide further impetus to India's milk production over the coming years. The hub model was developed based upon farmer owned and managed milk collection and chilling centres in remote rural areas. Several measures have been initiated by the government to increase the productivity of livestock, which has results in increasing the milk production significantly from the level of 102.6 million tons at the tenth plan (2006-07) to 127.9 million tons at the end of the eleventh plan (2011-12). Milk production during 2013-14 and 2014-15 was 137.7 million tones and with an annual growth rate of 3.97% and 6.27% respectively. This means that the world's average farmer keeps 2.9 milk animals with an average annual milk yield of approximately 2.1 ton ECM/animal/year. Of course, building averages is an over simplification. There is a wide variation of dairy farms in the world ranging from less than 3 cows per farm in some countries to over 1,000 cows per farm in others. The simple example shows that milk production is performed distinctively in different countries and their dairy regions. The dairy farming systems differ significantly in terms of farm size, housing, mil king and feeding systems Hence, keeping in view the above facts into consideration, the present study was carried out with the following objectives: To study the social, economical, profile of the respondents [1,2].

Methodology

The study would be undertaken in Sultanpur district purposively because in this district there is highest milk production among all the entire District in Faizabad. There are a total number of 69 milk cooperative societies under cooperative milk union Sultanpur district. These cooperative societies will be arranged in descending order according to the total milk collection at each cooperative society. From the list of cooperative societies, 10 milk cooperative societies having highest milk collection will be selected purposely. The list of member dairy farmers will be prepared from the selected milk cooperative society. From the list 10 members dairy farmers from each of the selected society would be selected randomly. A similar number of non member dairy farmers having almost same socio economic characters would be selected from the same village [3-7].

VOL. VIII, SPECIAL ISSUE, NATIONAL SEMINAR ON RTTEPSR NDUAT AYODHYA-2019 MULTILOGIC IN SCIENCE ISSN 2277-7601
An International Refereed, Peer Reviewed & Indexed Quarterly Journal in Science, Agriculture & Engineering

IMPACT OF KVK TRAININGS ON PROMOTION OF BACKYARD POULTRY FARMING IN AZAMGARH DISTRICT

[1]L.C. Verma, [1]R.Nayak, [3]R.P.K. Singh,[1]R. K. Anand, [4]A. K. Yadav [1]R.P. Singh and [2]S.K. Sachan
[1]SMS/Associate Processor, KVK, NDUAT, Kotwa, Azamgarh-276207 (U.P.) India
[2]Professor, College of Vet.Science & Ani.Husbandry. NDUAT, Ayodhya-224229
[3]Farm manager, KVK, NDUAT, Kotwa, Azamgarh-276207 (U.P.) India
[4]Scientist, KVK, NDUAT, Kotwa, Azamgarh-276207 (U.P.) India

Abstract

Backyard poultry has tremendous scope for quick and large term profit. In recent years, backyard poultry production has been extremely emphasized in sustaining and enhancing rural livelihoods for rural youth. A present study was undertaken in eight blocks of district Azamgarh of Uttar Pradesh to know the impact of trainings on scientific method of backyard poultry farming among small and marginal poultry farmers participated in KVK`s training programme. Collection of data regarding gain in knowledge and adopted level about improved poultry science technologies in backyard poultry farming were recorded before and after trainings. The findings revealed that 98.07 farmers gained knowledge in housing, 92.30% in breed awareness, 86.92%in balanced poultry feed, 80.76 % in vaccination, 69.23% in deworming, 59.61% in lime stone grit, 28.74 % in grazing and 10.00% in azolla feed, respectively. Study showed that very few farmers were known about scientific method of backyard poultry farming before training programmes whereas, after training programmes the level of adoption increased as 80.19% in concentrate feed, 79.80 % in breed awareness, 77.50% in vaccination, 67.31% in deworming, 51.92% in grazing, 50.96% in lime stone grit, 11.54% in housing, and in azolla feeding 10.0%. The overall adoption percentage by the farmers indicated that training had significant impact in uptake of new technologies.

Keywords: backyard poultry, training, vaccination, adoption level, farmers

Introduction

Poultry farming has now become a remunerative business and pre-eminence over all other livestock enterprises in the developing countries. Backyard poultry farming play an important role in the economic development of the country. In general, economic development refers to a process of upward changes of human resources which can be improved through increasing knowledge and attitude level of the rural take holders. Training is an integral and crucial input for the human resources development in all walks of life, be it agriculture, poultry husbandry, animal husbandry, fisheries or any other field for bringing out desirable changes in human behaviour (Biswas *et al.*, 2008). The concept of training programmes in scientific method of Backyard poultry farming through KVK grew substantially due to greater demand for improved poultry science technology by the farmers. Poultry population plays an important role in the national economy and socio-economic development of the landless, small and marginal farmers by supplementing family incomes and generating gainful employment.

The majority of the Kadaknath, Banraja are non-descriptive and native breeds also. Most of the farmers are rearing poultry under traditional pattern and lack of scientific knowledge. Therefore, the present study was undertaken with the specific objective to know the impact of trainingimparted by KVK, Azamgarh on scientific method of backyard poultry farming and feeding practices.

Materials and Methods

The study was carried outby NDUAT, KVK, Azamgarh in eight villages *viz.*, Gopalpur, Punarji, Auti pahalwanpur, Akma, Bharthahi, Mirza adampur, Panshabda and Surjanpur of eight blocks *viz.*, Palhani, Jahanganj, Bilariyaganj, Tahbarpur, Sathiyaon, Lalganj, Azmtgarh and Mohammadpur respectively, Azamgarh district were selected by NDUAT-Krishi Vigyan Kendra, Azamgarh, U.P., India (Table 1).

These blocks were selected because of large number of small and marginal farmers were participated in KVK`s training programme. Hands on on-campus training programmes were conducted on feeding, breeding and disease management under scientific dairy farming at KVK, Azamgarh. Participants took interest and eagerly participated in training programme. Pre-determined questionnaire supplied to trainees (rural youth farmers and farm women) participated in trainings organized at KVK to know and record their experiences.

Off-campus training programmes also organized for Self-help groups (SHGs) to visit their farm and confirm their adoption regarding scientific method of backyard poultry farming at farm level. During off campus trainings data were collected through personal contacts with the help of well-structured interview schedule. At end of training programme feedback form were collected from trainees. Inputs like dewormer, lime stone grit, balanced poultry feed and azolla seed culture and training materials were supplied. The selection of beneficiaries based on poultry farming trainees of KVK during preceding three years (2016-2018) was prepared. Out of 950 trainees list, only 520 farmers were randomly selected from that eight blocks. The gathered data were processed, tabulated, classified and analyzed in terms of percentage in the light of objectives of the study. Total practices were selected to find out the extent of knowledge and adoption of scientific method of backyard poultry farming.

Table-1: Selection of farmers from different blocks of adopted village

S. No.	Name of Block	Name of Villages
1.	Palhani	Gopalpur,
2.	Jahanaganj	Punarji
3.	Bilariaganj	AutiPahalwanpur
4.	Tahbarpur	Akma
5.	Sathiyaon	Bharthahi
6.	Lalganj	MirjaAdampur
7.	Azmatgarh	Panshabda
8.	Mohammadpur	Surjanpur

Results and Discussion

Gain in knowledge

The gain in knowledge by the respondents about scientific methods of backyard poultry farming and azolla feeding was measured in term of percentage. The data regarding gain in knowledge about scientific method of backyard poultry farming and feeding technologies were recorded under two heads *i.e.* knowledge before training and after training.

The data presented in the Table 2 revealed that, the beneficiary farmers of backyard poultry farming training programmes gained highest knowledge about housing system (semi intensive and intensive) (98.07%), followed by new breed (92.30%), balanced poultry feed (86.92 %), vaccination (F-1, Gumboro) (80.76%), deworming (69.23%), lime stone grit (59.61%), grazing (28.74 %), and andazolla feed (10.0%). The findings of the study revealed that farmers gained knowledge ranging from 10.0% to 98.07%. Verma *et. al.*, (2018) and Sivashankar and Khedgi (2011) revealed that training has a definite impact on the knowledge level of the respondents. This might be due to the fact that they were convinced through training programmes about scientific method of backyard poultry farming and azolla feeding by KVK, which were designed to import latest knowledge through work experience.

EXTENT OF ADOPTION

International Archive of Applied Sciences and Technology
Int. Arch. App. Sci. Technol; Vol 9 [3] September 2018 : 24-32
© 2018 Society of Education, India
[ISO9001: 2008 Certified Organization]
www.soeagra.com/iaast.html

IAAST
ONLINE ISSN 2277- 1565
PRINT ISSN 0976 - 4828

CODEN: IAASCA
ORIGNAL ARTICLE

DOI: .10.15515/iaast.0976-4828.9.3.2432

Constraints faced by dairy farmers and suggestions for overcome the dairy milk cooperative societies in Sultanpur district of Uttar Pradesh

Sanjeev Atreya[1], Prakash Singh[1], Subodh Kumar[2], P.K. Singh[2], Manoj Kumar[1] and Kaushik Prasad[1]

[1]Department of Extension Education NDUA&T Kumarganj Faizabad U.P. 224229
[2] Department of Veterinary & Animal Husbandry Extension N.D.U.A. &T., Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India
Corresponding email- sanjeevatrey365@gmail.com

ABSTRACT

This study was conducted in Sultanpur district purposively selected because in this district there is highest milk production among all the entire district in Faizabad commissionery (U.P.). The study reveals that in case of Member dairy farmers in district Sultanpur dairy farmer, the maximum number of respondents constraints faced like, the women do not come out from the houses for taking care the animals because of social values, nonfunctional of animal insurance schemes, improved breed are not available in nearby market, lack of transport facilities, non availability of knowledge of insurance, lack of availability of green fodder, high cost of veterinary treatment, lack of remunerative milk prices and suggestions are growing green fodder and storage of straw, government must provide marketing facilities at village level for selling the milk and milk products, improved breeds should be made available in nearby markets, made appropriate infrastructure of shed, accumulate knowledge from veterinary officers, VLO, social campaigns regarding vaccination should be conducted in village, animal health clinic should be established nearest to the village, precision should be made by the govt. regarding fixation of prices with involvements of the dairy farmers. Likewise, in case of Non-Member dairy farmers in district Sultanpur dairy farmer, the maximum number of respondents constraints faced like, distantly located animal health clinic, nonfunctional of animal insurance schemes, lack of knowledge about cattle breed improvement for higher milk production, non availability of knowledge of insurance, lack of availability of green fodder, high cost of veterinary treatment, poor transportation also affects adversary in proper disposal of the products and suggestions are properly contact to veterinary doctor and means for reach to animal to AHC, proper prices for milk and milk products should be insured, lack of knowledge about cattle breed improvement for higher milk production, improved breeds should be made available in nearby markets, made appropriate infrastructure of shed, accumulate knowledge from veterinary officers, VLO and precision should be made by the govt. regarding fixation of prices with involvements of the dairy farmers.
Keyword – Dairy farmer, Dairy Society, Constraint, etc.

INTRODUCTION

The unique characteristic of Indian dairy industry is that bulk of milk production in our country is handled by small milk producers who are illiterate and ignorant of economic aspects of milk production dairying is a secure path and future of our neural development and became a commercial enterprise. It can contribute substantially to farmer's income. His way of looking to the daring has not been changed from subsidiary to commercial business. These problem seriously reduce the production potentials of animals, especially cross breeds as they are more susceptible to diseases, hardships and contingencies peculiar to the Indian climate. The reproductive capability the animal, a major concern in its economic losses to farmer's value in dairy farming is frequently related to paripartient events as undesirable health related to events during this period might result in tremendous economic losses to farmers. By the end of gestation in dairy make huge demands for energy, protein is such that it occurs at the most productive period of a lactating animal (Tholkappian and Satheeshkumar2014).

 ©2018 Society of Education, India

Progressive Research – An International Journal
Print ISSN : 0973-6417, Online ISSN : 2454-6003
Volume 13 (Special) : 576-577 (2018)

Society for Scientific Development
in Agriculture and Technology
Meerut (U.P.) INDIA

267

EFFECT OF MINERAL MIXTURE AND DEWORMING ON FERTILITY IMPROVEMENT IN DAIRY ANIMALS—AN ON FARM TRIAL (OFT)

L.C. Verma[1], S.K. Sachan[2], S.B. Katole[3], R.K. Singh[1], R. Nayak[1] and A.K.Yadav[1]

[1]*Krishi Vigyan Kendra, NDUAT, Kotwa, Azamgarh-276207 (U.P.) India*
[2]*Anand Agricultural University, Anand-388110 (Gujarat) India.*
[3]*College of Veterinary Science & Animal Husbandry, NDUAT, Faizabad*

ABSTRACT

A study was undertaken in the Azamgarh district of Utter Pradesh to examine the effect of mineral mixture and deworming on regularization of estrus in dairy animals. Buffaloes (28; age group 4–8 years) of which 14 were in anestrus and 14 were repeat breeder and Cow (8; age group 4-6 years) of which 8 were repeat breeder were selected and dewormed on first day and from next day all the animals were allowed to lick a mineral mixture @ 40-50 grams daily for 90 days during October to December. Observations on all dairy animals revealed an average increase of milk production from 1.5- 2.0 litre per animal per day in 50% of the animals and in 50% animals comes in heat and conceives so, milk production decline and some animal stop milking. The fodder intake was also increased following mineral mixture supplementation and deworming in dairy animals. Moreover, some of the anestrus buffaloes came in heat during the study period however, after 20-30 days of completion of trial 75% (21/28) of the buffaloes and 62.55% (5/8) came in heat and conceived to first impregnation, which, normally show estrus from January to April. It was concluded that anthelmintic drugs decreases the parasitic load and mineral mixture being a good source of essential minerals improved milk yield, dry matter intake, general health status and reproductive performance of dairy animals.

Key words : *Mineral Mixture, Deworming, Anoestrus, Dairy Animals.*

In present time dairy sector faces major problems of infertility, repeat breeding and anoestrus in livestock which are hindering welfare of farming community. The farmers reared the animals are generally fed variable quantity of low quality feed resources like wheat straw and rice straw which are characteristically low in fermentable nitrogen, mineral, and readily available carbohydrate. These deficiencies result in low animal growth, poor reproduction, long calving interval, and infertility in animals. Inadequate nutrition is one of the factors that frequently limit the full utilization of the productive and reproductive potential of livestock in this region. Developing alternate feeding strategies for ruminant by enhancing the nutritive value roughage is of prime importance. A mineral mixture with locally available agricultural byproducts like wheat bran, rice bran, mustered cakes, common salt and molasses has been adoptable feed supplement which improves nutritional status of animals (Kang *et al.*, 2007).

Baseline survey to identify the commonly problem in dairy animal and an on farm trial (OFT) were formulated and conducted. However, the successful treatment and control of mineral deficiencies and practical methods of supplementation and reducing worm burden have been tried. Feeding of only the deficient minerals may not improve the general health status, production and reproduction of animals in these areas but also lower down the worm infestation. Hence, the present study was undertaken to evaluate the effect of mineral mixture as supplementary feeding and deworming on the general health condition, milk yield and reproductive performance of dairy animals.

MATERIALS AND METHODS

Adult Murrah and cross breed buffaloes (28) and cross breed cow (8) from different block and villages of Azamgarh district was selected by NDUAT-Krishi Vigyan Kendra, Azamgarh, U.P., India (Table 1). They generally fed their animal through grazing and variable quantity of local grasses and wheat straw. Trial was conducted during the period from October to December. The buffaloes were in 4-8 years and cross bred cow of 4-6 years age group. Anoestrus was observed in 28 buffaloes and 8 cows. All the animals were dewormed before supplementation of mineral mixture @ 40–50 gm/day daily for 90 days. Close observations were made on buffaloes on changes, if any, in feed intake, milk yield and oestrus activity. Statistical comparison of data was done as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Most of the selected buffaloes showed poor body condition with loss of musculature, dull and depressed with rough and dried skin coat. Anoestrus was the major problem as 100% of the selected buffaloes and cows had not shown estrus for the last over 6 months. The health condition of the selected buffaloes suggested that malnutrition and worm load might have been the cause of anoestrus.

However, after 90 days of supplementation with

(2.86)

International Archive of Applied Sciences and Technology
Int. Arch. App. Sci. Technol; Vol 8 [3] September 2017: 32-36
© 2017 Society of Education, India
[ISO9001: 2008 Certified Organization]
www.soeagra.com/iaast.html

IAAST
ONLINE ISSN 2277- 1565
PRINT ISSN 0976 - 4828

CODEN: IAASCA
ORIGINAL ARTICLE

DOI: .10.15515/iaast.0976-4828.8.3.3236

Psychological Characteristics and Communication behavior MNREGA beneficiaries women and non-beneficiaries women in Faizabad District

[1]Sadhana Gupta, R.R Yadav[1], [2]Subodh Kumar, and [3]Manoj Kumar

[1]Home Science Extension and Communication Management N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad (U.P.)- 224229

[2]Collage of Vat nary Science, N.D.U.A.T Kumarganj Fizabad U.P (224229)

[3]Department of Extension Education, College of Agriculture,N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad

[4]Department of Agricultural Extension, College of Agriculture, SVPA&T, Modipuram Meerut (U.P) 250110 (U.P.)- 224229

ABSTRACT

The study was conducted in purposely selected Milkipur block of Faizabad district (U.P.) selected purposively. A total number of 120 respondent i.e. 60 beneficiaries women & 60 non-beneficiaries women were selected through random sampling. Finding that Contact of beneficiaries women was maximum with Gram pradhan (2.23). In case of informal sources, maximum contact of beneficiaries women was seen with family members (3.18). In case of mass media exposure, the maximum respondents among beneficiaries women were using mobile (5.9). Majority of respondents among beneficiaries women (78.33%) were in medium whereas majority (51.67%) of non beneficiaries women were having low level of economic motivation. Majority of respondents of beneficiaries women (65.00%) had medium and (61.67%) non beneficiaries women were having low level of risk orientation.. Majority of respondents of beneficiaries women (83.34%) had medium and half of the non beneficiaries women were having low level of scientific orientation.

Key word- *MNREGA , beneficiaries women, non beneficiaries women*

Received 02/04/2017 Revised 22/02/2017 Accepted 09/07/2017

Citation of this article

Sadhana Gupta, R.R Yadav, Subodh Kumar, and Manoj Kumar. Psychological Characteristics and Communication behavior MNREGA beneficiaries women and non-beneficiaries women in Faizabad District. Int. Arch. App. Sci. Technol; Vol 8 [3] September 2017. 32-36.

INTRODUCTION

The Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) is the first tangible commitment to the poor. The scheme aims at providing employment as a source of income by ensuring their dignity. Thus, it was considered a unique scheme, which provides them Right to Work, trend in the Constitution under directive principles of state policy. In this sense the scheme was supposed to be the most unique scheme after independence as it provides them statutory right to employment. The government has a statutory obligation to provide employment to every rural household in a financial year [1-4]. Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) is a beneficial program for rural adult men and Women. MNREGA which was implemented by Ministry of Rural Development (MoRD), Government of India. MNREGA is the flagship program of the Government that directly touches lives of poor and promotes inclusive growth. It provides a right for guarantee employment of the rural population through an act of parliament. The National Rural Employment Guarantee Act (NREGA) was launched in 25 August, 2005. The Act received the assent of President on September 5, 2005 and was notified on September 7, 2005. It was implemented in India "s most backward districts on February 2, 2006. The law was initially called the National Rural Employment Guarantee Act (NREGA) but was renamed on 2 October 2009 as MNREGA. The MNREGA is an Indian job guarantee scheme,

Journal of Pharmacognosy and Phytochemistry 2017; 6(3): 222-225

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(3): 222-225
Received: 20-03-2017
Accepted: 21-04-2017

Archana Yadav
Research Scholar, N.D. University of Agriculture and Technology, Faizabad, U.P., India

Dr. Deepa Verma
Asst. Prof. Dept. of home Science, G.P.S. Govt. Mahila P.G. Collage, Azamgarh, U.P, India

Dr. Subodh Kumar
Assoc. Prof Dept. of Vet. Ext. N.D. University of Agriculture and Technology, Faizabad, U.P., India

Correspondence
Archana Yadav
Research Scholar, N.D. University of Agriculture and Technology, Faizabad, U.P., India

Study on knowledge of rural women for food grain storage practices in Faizabad district

Archana Yadav, Dr. Deepa Verma and Dr. Subodh Kumar

Abstract
The study was conducted in Milkipur block of Faizabad district (U.P.) selected purposively. A total number of 100 beneficiaries were selected through random sampling. Five sample villages were selected on the basis of random sampling. The structure schedule was developed keeping in view the objectives and variables under study. The respondents were contacted personally for data collection. The percentage, mean and standard deviation were used for calculation and drawing the inferences. The majority of the respondent 62% were found in categories (31-50) of age group, 61% literate, 48% other backward caste, 62% joint family, 49% small size of landholding, 55% no participation in any organization, 70% economic motivation, 83% scientific orientation was found in medium categories respectively. In case of knowledge level regarding food grain storage practices of respondents the majority number of 79% respondents belongs to medium category.

Keywords: scientific orientation, economic motivation, beneficiaries

Introduction
The post-harvest losses in India amount to 12- 16 million metric tons of food grain each year, an amount that the World Bank stipulates could feed 1/3rd of India's poor. The monetary value of these losses amount to more than Rs. 50,000 crores per year (singh, 2010) [12]. Losses of food grains are reported due to attack of insects, pests and rats during storage. Therefore, control of rats becomes inevitable in the crop field, godowns, residential premises (Ramesh, 2001) [11]. During storage quantitative as well as qualitative losses occur due to insects, rodents and microorganisms. A large number of insect, pest have been reported to be associated with stored grains. As in India, women have a crucial role to play in post-harvest technology particularly that relating to winnowing and grain storage. Thus, Proper handling and management need to teach systematically to rural women in order to prevent or reduce losses to some extent.

Methodology
This study was conducted at N.D. University of Agriculture & Technology; Faizabad U.P. Faizabad district is selected purposively for the study undertaken. The Faizabad district is located in the eastern plain zone of U.P. A total of 100 women were identified as sample size for the study. Data will be collected through personal interview using with restructured schedule. The variables were selected according to the objectives of the study. For study the different constraints different scales were used. The scale developed by Supe (1969) was used to measure the economic motivation and scientific orientation. Tabulated data were analyzed by using statistical measurement like, standard deviation, mean etc.

Result and discussion
Socio-Economic Profile
Table -1 shows that majority of the respondents (15%) were observed in the category (above to 50) age group following category (up to 23) age group was found (23%) and the category (31-50) age group their percentage was found (62%) respondents. So, it focuses that the rural women of age group (up to 23) and (31-50) age group are mostly engaged in food grain storage practices under the study. In this table majority of the respondents (61%) were found belonging to the literate category and the rest (39%) were illiterate. It also indicates that maximum number of the respondents (48%) belong to backward caste, while the general caste and scheduled caste were 40 percent, respectively. It might to be because of majority of OBC population in Faizabad district was adopted agriculture as their main occupation so they were engaging storage of grains as their farm produce. Thus, it is concluded that majority of respondents (48%) of food grain storage practices were from backward caste.

Journal of Pharmacognosy and Phytochemistry 2017; 6(6): 303-305

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2017; 6(6): 303-305
Received: 08-09-2017
Accepted: 09-10-2017

Sadhana Gupta
Home Science Extension and Communication Management N.D.U.A &T., Narendra Nagar (Kumarganj), Faizabad, Uttar Pradesh, India

Subodh Kumar
Collage of Vat nary Science, N.D.U.A.T Kumarganj Faizabad, Uttar Pradesh, India

Manoj Kumar
Department of Agricultural Extension, College of Agriculture, SVPA&T, Modipuram Meerut, Uttar Pradesh, India

Correspondence
Manoj Kumar
Department of Agricultural Extension, College of Agriculture, SVPA&T, Modipuram Meerut, Uttar Pradesh, India

Impact of MNREGA and level of awareness on Socio – economic profile of rural women in Faizabad district

Sadhana Gupta, Subodh Kumar and Manoj Kumar

Abstract
The study was conducted in purposely selected Milkipur block of Faizabad district (U.P.) selected purposively. A total number of 120 respondent *i.e.* 60 beneficiaries women & 60 non-beneficiaries women were selected through random sampling. Finding that majority of the beneficiaries women (43.33%) were observed in high category awareness awareness whereas the majority of non-beneficiaries women (38.33%) were observed in high category awareness Out of 18 variables studied, 11 namely *viz*- education, housing pattern, occupation, annual income, social participation, material possession, extension contact, economic motivation, risk orientation, scientific orientation and level of awareness were found to be highly significant difference between beneficiaries and non-beneficiaries women. Whereas 7 variables, i.e.- age, caste, family type, family size, type of worker, landholding area and marital status were shown non- significant difference between MNREGA beneficiaries and non-beneficiaries

Keywords: MNREGA beneficiaries, non-beneficiaries

1. Introduction

Social and economic development is the main aim of rural development for rural people, especially to bring about sustained improvement in their living condition through an increase in their income and access to social goods. The status of women is intimately connected with their economic status, which in turn, depends upon rights, roles and opportunity for the participation in economic activities. The economic status of women is now accepted as an indicator of a societal development. However, all development does not result in improving women economic activities. Pattern of women activities are affected by the prevailing social ideology and are also linked with the stage of economic development. Government implements different programmes to improve the social and economic development in rural India.

The Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) is the first tangible commitment to the poor. The scheme aims at providing employment as a source of income by ensuring their dignity. Thus, it was considered a unique scheme, which provides them Right to Work, trend in the Constitution under directive principles of state policy. In this sense the scheme was supposed to be the most unique scheme after independence as it provides them statutory right to employment. The government has a statutory obligation to provide employment to every rural household in a financial year.

Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) is a beneficial program for rural adult men and Women. MNREGA which was implemented by Ministry of Rural Development (MoRD), Government of India. MNREGA is the flagship program of the Government that directly touches lives of poor and promotes inclusive growth. It provides a right for guarantee employment of the rural population through an act of parliament.

The National Rural Employment Guarantee Act (NREGA) was launched in 25 August, 2005. The Act received the assent of President on September 5, 2005 and was notified on September 7, 2005. It was implemented in India "s most backward districts on February 2, 2006. The law was initially called the National Rural Employment Guarantee Act (NREGA) but was renamed on 2 October 2009 as MNREGA. The MNREGA is an Indian job guarantee scheme, enacted by legislation. MNREGA is a social security legislation with a right based framework. The purpose of the Act is to make resilient resources and enhance the income source platform of the rural inadequate. It aims to enhance livelihood security in rural areas by providing at least 100 days of guaranteed wage employment to every rural household whose adult members volunteer to do skilled and unskilled manual work.

This programme is effective targeting of marginalized groups (scheduled castes, scheduled tribes, BPL and women) and use of MNREGA as a supplementary income source during

Int.J.Curr.Microbiol.App.Sci (2017) *6*(2): 1450-1458

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 2 (2017) pp. 1450-1458**
Journal homepage: http://www.ijcmas.com

Original Research Article http://dx.doi.org/10.20546/ijcmas.2017.602.162

Socio Economics Variability of the Livestock Owners Lakhimpur (Kheri) (U.P), India

Aditya Kumar Kannojiya[1] and Subodh Kumar[2*]

[1]Department of Animal Husbandry U.P, India
[2]ILFC Collage of Veterinary Science and A.H., N.D.U.A.T Kumarganj Fizabad U.P (224229), India
**Corresponding author*

Keywords

Milk Production Practices, Farmers, Animals, Live stock Owners.

Article Info

Accepted:
24 January 2017
Available Online:
10 February 2017

A B S T R A C T

The indigenous technical knowledge (ITK) regarding animal husbandry is considered as old as domestication of various livestock species. Unfortunately, these practices which are in vogue throughout the rural India are little documented and there is danger of extinction of this knowledge. Thus it is become imperative to collect and document these practices. A semi structured interview schedule was used for the data collection from 10 traditional healers and 120 livestock owners. It was found that improved farm implements aid not only in saving labour but also increases working efficiency at farm. The majority of the respondents (56.67%) were found belonging to medium material possession category while 18.33 percent and 25.00 percent of respondents were of low and high material possession category, respectively.

Introduction

India's livestock sector is one of the largest in the world. According to 18th livestock census (2007) there are 199 million cattle, 105 million buffaloes, 72 million sheep, 141 million goats,11 million pigs and 649 million poultry birds in India, contributing 56.7 percent of world's buffaloes, 12.5 percent cattle, 20.4 percent small ruminants, 2.4 percent camel, 1.4 percent equine, 1.5 percent pigs and 3.1 percent poultry (Anonymous, 2011). In 2010-11, livestock generated output worth rupees 2075 billion (at 2004-05 prices) which constitutes 4 percent of the India's total GDP and 26 percent of the agricultural GDP. The word 'indigenous' means native born origination or produced naturally in a country or in specified area and the word knowledge means "assured belief practical skill, that is known, learning enlightenment" (Reijntjes *et al.*, 1993). The indigenous knowledge is also often taken to be synonymous with traditional knowledge (Richard, 1979). Also, the term indigenous is often interchangeably used with terms like traditional or local (Yadav, 1998). Traditional includes recent and future innovations provided and carried out by farmers but it does not mean "Absolute" i.e. neither absolute good nor bad (Pareira, 1993). However, Johnson (1993) feels that societies change through time constantly adopting new practices and technologies, making it difficult to define just how much and what kind of

The Histochemical Study of the Thyroid Gland of Chabro Chicken Reared in Summer and Winter Seasons

Amit Singh Vishen[1], Varsha Gupta, S.P. Singh, Abhinov Verma, Renu Yadav, Rakesh Kumar Gupta, K.N. Singh, Mukesh Kumar, Anand Singh

10.18805/ijar.B-3973

ABSTRACT

Background: Chabro is a strain of poultry birds especially designed for backyard farming and is more adoptive to climatic variations in the tropics. The thyroid gland plays an important role in controlling basal metabolic rate. Histochemical changes of the gland in association with seasonal changes have not been studied so far in Chabro chicken. The present study describes the season related variations in the histochemistry of thyroid gland.

Methods: The histochemical study was conducted on thyroid gland of eight to ten weeks old 24 apparently healthy Chabro chickens procured from Poultry Farm, DUVASU, Mathura. The birds were divided into two groups consisting of 12 chickens in each group reared in summer and winter seasons.

Result: The capsule showed mild reaction for PAS, protein and glycogen. Follicular cells showed intense reaction for bound lipids, protein and alkaline phosphatase. The colloid in summer season showed strong reaction for PAS at periphery and very strong reaction at center while in winter colloid showed strong PAS positive activity. The Chabro chicken thyroid was functionally more active in winter as compared to summer season because of increased diameter of all follicles and concentration of thyroid hormones level in winter season.

Key words: Chabro chicken, Histochemistry, Season, Thyroid gland.

INTRODUCTION

Thyroid is a bilobed structure situated on either side of trachea. It is the only gland in the body of both mammals and birds that stores hormone in its inactive form. The substance of the gland consists of roughly spherical thyroid follicles. The thyroid gland is a unique endocrine gland which plays an important role in controlling pre and post natal growth and differentiation of many organ systems. Chabro chicken was developed by Central Poultry Development Organization (CPDO) by crossing Barred Plymouth Rock with Red Cornish especially for the farmers of our country owing to more adoptive to climatic fluctuations and acclimatizes to the entire climatic zone. The study was conducted on thyroid gland because it plays an important role in basal metabolic rate, reproduction and development and growth of muscles and bones. On perusal of literature it is found that the histochemical studies in Chabro with special reference to season is very scanty. Hence, the present study is designed to record the seasonal behavior in thyroid gland.

MATERIALS AND METHODS

The present study was conducted in the year 2018 on thyroid gland of eight to ten weeks old 24 apparently healthy Chabro chickens procured from Poultry Farm, DUVASU, Mathura. The birds were divided into two groups consist of 12 chickens in each group (six male and six female) reared in summer and winter seasons. For histochemical observations, small pieces of the thyroid gland were collected and fixed in 10% neutral buffered formalin. Fixed tissues were processed by routine paraffin embedding technique (Luna, 1968) and 6µ paraffin sections were procured. For studying lipid and enzymes cryostat (15µ) sections were utilized. For histochemical and histoenzymic studies following staining procedures were carried out :

1.) Periodic Acid Schiff's (PAS) (Luna, 1968): For study of polysaccharides.
2.) Best's carmine method (Luna, 1968): For study of glycogen.
3.) Muller's Colloidal (hydrous) ferric oxide method (Luna, 1968): For study of Acid mucopolysacchandes.
4.) Acetone Sudan black method (Pearse, 1975): For study of bound lipids.
5.) The Calcium Cobalt method (Pearse, 1975): For study of Alkaline phosphatase.

Department of Veterinary Anatomy, College of Veterinary and Animal Sciences, U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura-281 001, Uttar Pradesh, India.

[1]Department of Veterinary Anatomy and Histology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya-224 229, Uttar Pradesh, India.

Corresponding Author: Amit Singh Vishen, Department of Veterinary Anatomy and Histology, College of Veterinary Science and Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya-224 229, Uttar Pradesh, India. Email: amitvishen56@gmail.com

How to cite this article: Vishen, A.S., Gupta, V., Singh, S.P., Verma, A., Yadav, R., Gupta, R.K., Singh, K.N., Kumar, M. and Singh, A. (2021). The Histochemical Study of the Thyroid Gland of Chabro Chicken Reared in Summer and Winter Seasons. Indian Journal of Animal Research. 55(3): 283-286. DOI: 10.18805/ijar.B-3973.

Submitted: 25-12-2019 **Accepted:** 11-04-2020 **Online:** 10-09-2020

Journal of Pharmacognosy and Phytochemistry 2018; SP1: 994-996

Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

Histological studies on the kidney of *Marwari* Sheep (*Ovis aries*)

Krishna Nand Singh, Sanjeev Joshi, Rakesh Mathur, Mukesh Kumar and SS Sengar

Krishna Nand Singh
Asstt. Professor, Department of Veterinary Anatomy and Histology, C. V. Sc & A.H., N. D.U.A & T., Kumarganj-Faizabad, U.P, India

Sanjeev Joshi
Department of Veterinary Anatomy and Histology, CVAS, Bikaner, Rajasthan, India

Rakesh Mathur
Department of Veterinary Anatomy and Histology, CVAS, Bikaner, Rajasthan, India

Mukesh Kumar
Asstt. Professor, Department of Veterinary Anatomy and Histology, C. V. Sc & A.H., N. D.U.A & T., Kumarganj-Faizabad, U.P, India

SS Sengar
Asstt. Professor, Department of I.P.T. C. V. Sc. & A.H., N. D.U.A & T., Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Krishna Nand Singh
Asstt. Professor, Department of Veterinary Anatomy and Histology, C. V. Sc & A.H., N. D.U.A & T., Kumarganj-Faizabad, U.P, India

Abstract
The microscopic studies of kidneys of 6 *Marwari* sheep showed that the thick fibrous capsule consisted of two layers. The outer layer of dense collagenous fibres with a few elastic fibres. Fibroblast and some smooth muscle cell were also present in outer layer. The inner layer consisted predominantly of reticular fibres with collagenous fibres and had a distinct thick smooth muscle layer. Interstitial tissue contained network reticular fibres which extended from the capsule to the apex of papilla. The juxtaglomerular structure and basement membranes were P.A.S. positive. The papillary duct lined with simple columnar epithelium which become transitional before opening into the papilla.

Keywords: *Marwari* sheep, Kidney, Histology, Capsule, Epithelium

Introduction
Marwari sheep constitutes a major portion of the sheep population in western part of Rajasthan which has 14.31 million sheep (about 40%) and plays an important role in the economy of arid and semi-arid tract. The present investigation has been planned to study the histological structure of the kidney to justify its importance and essentiality in the body. In mammals the kidneys are the chief excretory organs of the body. They have a major role in the maintenance of fluid and electrolyte balance and in control of the blood pressure.

Materials and Methods
For the histological examination the small pieces of tissues (2 mm size) were collected from 12 kidneys (6 right and 6 left). From each kidney, the tissues were collected from six fixed anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs, Bouin's fluid for 12 hrs, and Zenker's fluid for 18 hrs. Fixed tissue was latter washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60°C, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the H. & E. and special staining methods to demonstrate different components of kidney.

Results and discussion
The capsule and connective tissue septa
The kidneys were invested by a thick fibrous capsule which consisted of two layers Fig. (1), which simulate to the reports by [illegible] in bovine, Dellmann (1993) [1] in ruminants and Halder *et al* (2002b) [5] in spotted deer. Trautmann and Fiebiger (1957) [13] and Yadva and Calhoun (1958) [17] found that the fibrous capsule was composed of two distinct layers in horse, ox, Sheep and Goat. In the present study the outer layer was heavily laden with collagen fibres and fibroblasts were also seen between the collagen fibres. There oval nuclei were surrounded by a small amount of lightly acidophilic cytoplasm and cells had few short processes. Elastic fibres were very few between the collagenous fibres.
The inner thin layer consisted predominantly of reticular fibres with collagenous fibres. The reticular fibres were arranged parallel to the collagenous fibres and transversely dipped into the cortex of kidney. The inner layer had a distinct thick smooth muscle layer. Numerous smooth muscle cells were entangled between the loose collagenous and reticular fibres. Similar findings were reported by Gupta and Sharma (1991) [3] in yak and Zade *et al* (2007) [16] in panther. Whereas Malik *et al* (2001) [7] reported that thin renal capsule was composed of loose superficial and compact deep layers with inconspicuous smooth muscle fibres in Asian elephant.

Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020: SP-8(2): 25-27
© 2020 JEZS
Received: 10-01-2020
Accepted: 12-02-2020

Mahesh Kumar Bamniya
Veterinary Officer, Kuchaman city, Nagaur, Rajasthan, India

Rakesh Mathur
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., RAJUVAS, Bikaner, Rajasthan, India

Sanjeev Joshi
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., RAJUVAS, Bikaner, Rajasthan, India

KN Singh
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Mukesh Kumar
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Amit Vishen
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

S Gharu
Veterinary Officer, Bikaner, Rajasthan, India

Corresponding Author:
KN Singh
Department of Veterinary Anatomy& Histology, C.V.A. Sc. & A.H., ANDUAT, Ayodhya, Uttar Pradesh, India

Histological studies on the liver of Marwari Goat (*Capra hircus*)

Mahesh Kumar Bamniya, Rakesh Mathur, Sanjeev Joshi, KN Singh, Mukesh Kumar, Amit Vishen and S Gharu

Abstract
The histological studies were conducted on the liver of 15 Marwari goats. Histologically, the whole liver was invested by peritoneum, except where it was reflected as ligaments and where it adheres to the diaphragm. Underlying it, the liver covered by connective tissue covering called as glisson's capsule. It was composed of collagenous and reticular fibers and few smooth muscles. The reticular fibers formed the stroma. The hepatic lobules were made up of central vein, portal area and one cell thick cords, which were not delineated by connective tissue. The sinusoidals were narrow and somewhat cylindrical. These were lined by continuous endothelial cells resting on basal lamina. Kupffer cells were present attached to the endothelial cells. There were numerous mucous glands present in the mucosa of hepatic, cystic and common bile ducts. The centrilobular and the periportal hepatocyte were rich in the glycogen content.

Keywords: Histology, Marwari goat and Liver

Introduction
Marwari goat (*Capra hircus*) is a domestic animal distributed in the Marwar region of Rajasthan, comprising of Pali, Jodhpur, Jalore, Barmer, Bikaner, Nagaur, and Jaisalmer districts. The goat (*Capra hircus*), is one of the most important animal and the goat husbandry has been playing an important role in the economy of our country with special reference to milk, meat, manure and hide production. The Present study has been planned to justify the functional importance and essentially of the liver, the largest single organ. The resemblance of the structure of liver throughout the animal kingdom, from fishes up to higher vertebrates, encourages the interest to get factual structural details of that colossal gland. Important functions performed by the liver are secretion of bile, excretion of waste product, storage of glycogen and vitamins (Vit. A, D and B), synthesis of fibrinogen, prothrombin, albumin, globulin etc., phagocytosis of foreign particles, detoxification, intermediate metabolism of carbohydrates, proteins and fats and haemopoiesis in embryo. Liver plays an important role in digestion process of these nutrient matter and energy production. An understanding of the structure of liver is vital to the interpretation of these processes.

Materials and Methods
The present study was conducted on 15 apparently healthy adult Marwari Goat (*Capra hircus*) of either sex. The liver from the freshly slaughtered animals were procured from Municipal slaughter house, Bikaner. For the histological examination the small pieces of tissues (2mm size) were collected from 15 livers. From each liver, the tissues were collected from thirteen fixed anatomical regions to explore regional differences if any. The tissues were preserved in 10% formal saline for 48 hrs. Fixed tissue were later washed in running tap water for 6-10 hours followed by dehydration in ascending grade of alcohol, clearing, embedding in paraffin wax of melting point of 58-60 °C, preparation of blocks, section cutting (5-6 µm thick), and mounting of section on albuminized slides, drying of sections and finally stained with the following routine and special histological stains to demonstrate different components of liver.

Results and Discussion
The capsule and stroma
In present histological study the liver of Marwari goat was covered by outer peritoneal and the inner connective tissue covering. Similar findings were reported by (Leeson and Lesson, 1981) [4] in domestic animals, (Pareek, 2000) [10] in sheep and [6] and (Dellmann and Brown, 1981)

Int.J.Curr.Microbiol.App.Sci (2019) *8*(8): 2733-2743

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 8 Number 08 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.808.315

Management of White Mold Fungus *Sclerotinia sclerotiorum* (Lib) De Bary Causes Disease in Tomato under *In vitro* Conditions

N. K. Upadhyay[1*], Ved Ratan[1], Subhash Chandra[2], V. K. Yadav[2], Ajay Kumar[2], Deepak Awasthi[1], and Jai P. Rai[3]

[1]*Department of Plant Pathology, C.S. Azad University of Agriculture and Technology, Kanpur-222131(UP), India*
[2]*Department of Plant Pathology, N.D.U.A. & T., Kumarganj, Ayodhya-224229 (UP), India*
[3]*Krishi Vigyan Kendra, Inst. of Ag. Sci., RGSC, BHU, Barkachha, Mirzapur 231001, UP, India*

**Corresponding author*

Keywords

Sclerotinia, management, white mould, *in vitro*, tomato

Article Info

Accepted:
22 July 2019
Available Online:
10 August 2019

ABSTRACT

Tomato crop affected by different fungal diseases in which Fruit rot known as target spot disease incited by *Sclerotinia sclerotiorum* is one of the most destructive disease. Disease severity varied (30.50 to 18.60%) in different locations of Kanpur. Highest disease severity was (30.50%) and the lowest disease severity (18.60%) was noticed at the farmer's field of Billhore, Kanpur. *Sclerotinia sclerotiorum* is a soil borne pathogen which causes symptoms on ripe fruits. Pathogen isolated from infected fruits. Copper oxychloride, Kavach, Tebucanazol, Andrachite, Dithane M-45, Metalaxyl, Roko and Bavistin completely suspected the growth of pathogen*in vitro*. Among eight fungicides, Tebuconazol, Andrachite, Metalaxyl, Roko, and Bavistin were found effective against pathogen under *in vitro* and *in vivo* conditions. However, seven bio-agents (*Trichoderma* spp.), *T. koningii*, *T. virens*are found effective in bothconditions. *In vitro* eight fungicides were tested against pathogen in which Metalaxyl, Roko, Tebucanazol, Andrachite and Bavistin showed 100% growth inhibition. Seven bio-agents (*Trichoderma*spp.) were tested *in vitro* while, among them *T. koningii* showed maximum inhibition followed by *T. virens*, *T. longibrachiatum*, *T. atroviridae*, *T. asperallum*, *T. viridae* and *T. reesei*, respectively. Eight treatments were applied *in vivo* for disease management however, among them T_6 (*Bacillus subtilis* + bavistin) recorded the minimum disease incidence and maximum fruit yield.

Introduction

Sclerotinia sclerotiorum (Lib.) is a serious fungus affecting yield and product quality of many susceptible hosts. It is a widespread soil borne plant pathogen with an extremely wide host range of more than 400 plant species including many of economic importance (Gao *et al.*, 2014). *S. sclerotiorum* is responsible for more than 60 plant diseases (Purdy, 1979). The pathogen produces sclerotia, which survive for long periods and attackroots of growing and mature plants, resulting in root rot, basal stemcanker, and wilt (Duncan *et al.*,