# Journal of Plant Development Sciences
**(An International Monthly Refereed Research Journal)**

Volume 12 Number 7 July 2020

## Contents

# PERSPECTIVES ON ENHANCING VALUE OF AGRONOMIC BIOFORTIFICATION IN MAIZE

**Augustine R.* and D. Kalyanasundaram**

*Department of Agronomy, Faculty of Agriculture, Annamalai University, Chidambaram, Tamilnadu, India*
*Email: augustinerajendran@gmail.com*

*Received-07.07.2020, Revised-28.07.2020*

**Abstract:** Most of the health components based foods are boosted by the application of mineral nutrients. Farmers fertilize the crop for optimum to higher yields which has become essential, since post green revolution. In addition to higher yield, plant nutrition also affects other human nutritional needs like proteins, oils, vitamins and minerals. Trace elements necessary to human nutrition can be optimized by applying micronutrients to food crops. Some nutrients have their own restrictions to various factors like temperature, climate, time of applications, crop adaptability, etc., and few micronutrients are beneficial and play a significant role in food nutrition making easier access in the plant edible parts by its applications. It is important to note that foliar application of Zn and Fe at the later crop stage (mid booting stage or early milking stage) is found to be effective than early applications. When compared to related interventions like supplementation and fortification, biofortification was found to be significantly cost effective in applications to crop and creates value for human nutrition.

**Keywords**: Iron (Fe), Zinc (Zn), Micronutrients, Supplementation, Fortification, Bio fortification

Journal of Plant Development Sciences Vol. 12(7)

# BIOLOGY OF TOBACCO CATERPILLAR, *SPODOPTERA LITURA* FAB. ON DIFFERENT HOSTS AND ANTIFEEDANT EFFECT OF PLANT PRODUCTS ON IT

**Sonali Deole* and Tarun Kumar Nayak**

*Department of Entomology, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India-492012*
*Email: sonalideoleigkv@yahoomail.com*

*Received-10.07.2020, Revised-28.07.2020*

**Abstract:** *Spodoptera litura* (Fab.) (Lepidoptera: Noctuidae) is polyphagous pest damaging numerous crops in India and many other countries. Moths are found primarily active during night and due to its high mobility, female ovipositing on a wide range of host plants. There have been a number of studies on the biological parameters of *S. litura* on different host plants under different environmental conditions, particularly in India. Artificial diet reared tobacco caterpillar showed higher pupation (89.2%), emergence (97.2%), survival (86.6%) and fecundity (2486.2 eggs) as compared to the most preferred natural food,Out of 24 weed plants tested, high consumption of leaves was recorded on eight species. Dietary concentrations of azadirachtin although significantly lowered the efficiencies of conversion of both ingested (ECI) and digested (ECD) food, it failed to lower the approximate digestibility (AD).

**Keywords**: Biology, Host, *Spodoptera litura,* Tobacco caterpillar, Weeds

Journal of Plant Development Sciences Vol. 12(7)

GENETIC DIVERSITY ANALYSIS IN RICE (*ORYZA SATIVA* L.) LANDRACES OF NORTH EAST INDIA USING MORPHOLOGICAL AND RAPD MARKERS

**Rinya Punyo and H.P. Chaturvedi***

*Department of Genetics and Plant Breeding, Nagaland University, SASRD, Medziphema- 797106, Nagaland*
*Email: hpchaturvedi68@gmail.com*

*Received-06.07.2020, Revised-25.07.2020*

Abstract: Morphological and molecular characterizations of sixteen rice landraces of North East India were studied to observe genetic diversity and identification of superior genotypes for crop improvement program. Based on the relative magnitude of $D^2$ values, 16 genotypes were grouped into 3 clusters. Cluster I had the highest number of genotypes (9 genotypes), cluster II had 4 genotypes and cluster III had 3 genotypes. Cluster I showed the highest mean for plant height at maturity, cluster II for 1000 grain weight and cluster III for number of effective tillers/plant, number of filled grains/panicle and harvest index. 1000-grain weight showed the highest contribution towards divergence followed by plant height. In RAPD analysis some of the primers showed 100% polymorphism viz., AA-10, AA-14, OPA-02, OPA-04, OPB-03 and PRIMER-33. Overall percentage polymorphism revealed by RAPD primer was 77.75%. Dendrogram generated from the UPGMA cluster analysis divides the lines into two main clusters- cluster A and cluster B. Cluster A consist of 15 germplasm and Cluster B consist of 1 germplasm. Cluster A is further divided into two sub-clusters, 'a' and 'b'. Sub-cluster 'a' consist of 2 germplasm and sub-cluster 'b' consist of 13 germplasm. Principal coordinate analysis (PCoA) obtained for RAPD is in complete support of the conclusion drawn from the cluster analysis.

**Keywords:** Genetic diversity, Morphology, Rice

Journal of Plant Development Sciences Vol. 12(7)

## PHYTOSOCIOLOGY AND NUTRIENTS ANALYSIS OF DOMINATEDGRASSES OF PASTURELANDS IN KASHMIR VALLEY

**Amerjeet Singh*, Naveed Ahmad Padder, Arshid Mughal and Vashnu Dutt**

*Faculty of Forestry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Benhama, Ganderbal-191201, J&K India*
*Email: amerjeetskuast@gmail.com*

*Received-04.07.2020, Revised-25.07.2020*

**Abstract:** The study was carried out at three altitudes viz., Arishan, Harkani and Deesu, which were selected on the basis of altitude and migratory grazing status in Daksum range of Anantnag Forest Division, Kashmir in the year 2014-15. Samples of dominant grass species were collected for their nutrient analysis at all three sites. Results revealed IVI of herbaceous species indicated that *Poa annua* (63.72) was dominant at lower altitude while *Fragaria nubicula* (75.66) and *Poa pratense* (77.10) dominates the upper altitude site respectively (Fig 02).Thenutrient content of dominant grass species were recorded higher in all the three sites because the summer season is considered peak nutrient season for plant species. The highest nitrogen per cent was found in *Poa balbusa* (1.42%) at lower elevation, phosphorous per cent in *Cynodon dactylon* (0.41%) at middle elevation, Potassium per cent in *Poa annua* (0.74%) at lower elevation, calcium per cent and magnesium per cent in *Dactylis glomerata* (0.91%) and (0.99%) at lower elevation respectively (Table 01, 02 and 03). The IVI of herbaceous species indicated that *Poa annua* (63.72) was dominant at lower altitude while *Fragaria nubicula* (75.66) and *Poa pratense* (77.10) dominates the upper altitude site respectively (Fig 2).

**Keywords:** Phytosociology, Nutrients, Grasses, Nitrogen, Phosphorus, Calcium

Journal of Plant Development Sciences Vol. 12(7)

## GENETIC VARIABILITY, HERITABILITY AND GENETIC ADVANCE STUDIES IN FINGER MILLET (*ELEUSINE CORACANA* (L.) GAERTN) CULTIVARS UNDER FOOTHILL CONDITION OF NAGALAND

**P.M. Aralikatti and H. P. Chaturvedi***

*Department of Genetics and Plant Breeding, Nagaland University, SASRD, Medziphema- 797106, Nagaland*
*Email: hpchaturvedi68@gmail.com*

*Received-08.07.2020, Revised-28.07.2020*

**Abstract:** A set of 42 cultivars were studied for genetic variability, heritability and genetic advance of grain yield and its eleven component traits in finger millet. The analysis of variance revealed highly significant differences among the genotypes for all the twelve characters studied. The highest PCV and GCV were recorded for finger length and ear head length indicating presence of ample variation for these traits in the present material. In the present study, high estimates of heritability and genetic advance was obtained for finger length and ear head length. Thus selection for these traits is likely to

accumulate more additive genes leading to further improvement of their performance and these traits may be used as selection criteria in finger millet breeding program.

**Keywords:** Genetic variability, Heritability, Genetic advance, Finger millet

Journal of Plant Development Sciences Vol. 12(7)

## EFFECT OF INTEGRATED NUTRIENT MANAGEMENT PRACTICES ON LAI AND QUALITY PARAMETERS OF *BARLEY*

**Sandeep Kumar*, Meena Sewhag, Shweta, Neelam, Akshit and Uma Devi**

*Department of Agronomy,*
*CCS Haryana Agricultural University, Hisar, Haryana, India*

*Received-08.07.2020, Revised-27.07.2020*

**Abstract:** The present study entitled, "Effect of integrated nutrient management practices on LAI and quality parameters of *barley*" was conducted during the *rabi* season of 2017-2018 at the Agronomy Research Farm of Chaudhary Charan Singh Haryana Agricultural University, Hisar to study the effect of different nutrient management practices on quality parameters of barley. The soil of the experimental field is sandy loam in texture, slightly alkaline in reaction, low in organic carbon and nitrogen, medium in available phosphorus and potassium. The experiment was laid out in Randomized Block Design replicated thrice with ten different treatments viz. $T_1$(Control) , $T_2$ (*Biomix*) , $T_3$ (Vermicompost @ 5 t ha$^{-1}$), $T_4$ ( *Biomix* + Vermicompost @ 5 t ha$^{-1}$), $T_5$ (50 % RDN + *Vermicompost* @ 5 t ha$^{-1}$), $T_6$ (75 % RDN + *Vermicompost* @ 5 t ha$^{-1}$), $T_7$ (50% RDN + *Biomix* + Vermicompost @ 5 t ha$^{-1}$), $T_8$ (75 % RDN + *Biomix*+ Vermicompost @ 5 t ha$^{-1}$), $T_9$ (RDN) and $T_{10}$ (RDN + *Biomix* + Vermicompost @ 5 t ha$^{-1}$). Among various combinations of nitrogen fertilizer, *biomix* and vermicompost leaf area index at 30 DAS was highest in treatment $T_{10}$, being significantly higher than other treatments but statically at par with treatment $T_8$ and $T_9$. Similarly at 60 and 90 DAS the difference in leaf area index value of barley at in treatment $T_8$, $T_9$ and $T_{10}$ were not significant but higher than other treatments. Treatment $T_{10}$ (11.74 %) being at par with treatment $T_3$ to $T_9$ resulted in significantly higher protein content of barley and treatment $T_1$ being at par with treatment $T_2$ recorded significantly higher value of malt content of barley than treatment $T_3$ to $T_{10}$. But various combinations of nitrogen fertilizer, *biomix* and vermicompost fail to influence hectoliter weight and boldness as well as thinness of barley grain.

**Keywords:** Barley, Nutrient, Rabi

Journal of Plant Development Sciences Vol. 12(7)

## PRACTICES AND PERCEPTION OF RURAL HOUSEHOLDS ABOUT CATTLE WASTE DISPOSAL AND MANAGEMENT

**Deepa Indoria*, Mani Ram[1]**

*Krishi Vigyan Kendra, Chittorgarh, MPUAT, Udaipur, Rajasthan*
*[1]Krishi Vigyan Kendra, Rajsamand, MPUAT, Udaipur, Rajasthan*
*Email: deepa.indoria123@gmail.com*

*Received-25.06.2020, Revised-27.07.2020*

**Abstract:** This study was conducted in the village Gorakhera of panchayat samiti Bhadeshar in Chittoergarh district of Rajasthan to assess the type and quantity of household waste generated and its disposal pattern. Quantity of waste generated was reported in the form of headload. For animal waste, the head load contained cow dung about 10-12 kg/ basket. On an average, a family with 4-5 animals produced 2-3 number of such head loads and another head load of 4-5 kg on daily basis consisted of leftover of household/ animal /agro waste. The biodegradable household waste consisting of kitchen waste, ash, and paper, remainder of fodder by animals, urine and dung of animals were thrown in Ruddy. Under non biodegradable waste, poly bags were burnt for igniting the fire in the home. The metal and glass and plastic waste were sold to the vendors. The type and quantum of inorganic waste consisting of plastic, china ware, glassware, batteries, paints, pesticides, insecticides and their containers, left over medicines, varied according to landholdings, means of transportation and type of house. They were aware about the hazardous waste but were not aware about its proper management. Dung cakes were stored in bitoda - a rectangular structure with tapering at the top plastered by a mixture of dung and agro waste in a proportion of 9:1. During rainy season, there is no making of dung cakes; hence, all the animal waste is disposed of at Ruddy to be used as manure later on.

**Keywords**: Waste management, ATT (Agriculture Transfer Technology), Recyclable waste

Journal of Plant Development Sciences Vol. 12(7)

## SEASONAL INCIDENCE OF CORN EARWORM, *HELICOVERPA ARMIGERA* IN RELATION TO ABIOTIC PARAMETERS ON MAIZE

**Saurabh Jaiswal**, **P.K. Bhagat, Shani Raj*, G.P. Painkra and K.L. Painkra**

*Department of Entomology, Raj Mohini Devi College of Agriculture and Research Station, Ambikapur -497001 (C.G.) India*
*BTC, College of Agriculture and Research Station, Billaspur (C.G.) India*
*Email:saurabhjais.101@gmail.com*

*Received-02.07.2020, Revised-24.07.2020*

**Abstract:** The field experiment was conducted at Raj Mohini Devi College of Agriculture and Research Station, Ambikapur (C.G.) during *kharif* 2019, to know the seasonal incidence of corn earworm, *Helicoverpa armigera* infesting maize. Corn earworm appeared during 31$^{st}$SMW *i.e.* 28$^{th}$ July-5$^{th}$ August (2nd week). The peak population of corn earworm was observed in the first week of September with a mean population of 1.10 larvae/plant. The correlation between corn earworm, *Helicoverpa armigera* and weather parameters during *kharif* 2019 results indicated that the population demonstrated a significant positive correlation with maximum temperature (r =0.577). The regression equation being y= 2.805x+26.97 indicating that within increase in 1$^{0}$C maximum temperature there will be increase in population by 2.805.

**Keywords:** Correlation, *Helicoverpa armigera*, Incidence, Maize

Journal of Plant Development Sciences Vol. 12(7)

## AWARENESS REGARDING WOMEN EMPOWERMENT PROGRAMMES IN BARMER DISTRICT OF RAJASTHAN

**Pradeep Pagaria* and Sonali Sharma**

***Krishi Vigyan Kendra, Barmer II***
***Krihi Vigyan kendra, Barmer I***

*Received-10.07.2020, Revised-28.07.2020*

**Abstract:** Empowerment is the main process of social development which can enable women to participate, in the economic, political and social sustainable development of the rural communities. Today the empowerment of women has become one of the most important concerns of 21st century but practically women empowerment is still an illusion of reality. Empowerment of women is essentially the process of upliftment of economic, social and political status of women, the traditionally underprivileged ones in the society. We observe in our day to day life how women become victimized by various social evils. Women Empowerment is the vital instrument to expand women's ability to have resources and to make strategic life choices. It is the process of guarding them against all forms of violence. The study is based on purely from secondary sources. The present study was an attempt to know utilization of these programmes by rural home-makers. The study was conducted in 50 rural households of two villages selected from one block of Barmer district. The results revealed

that few respondents (9.0 %) were aware of the year of women empowerment as well as various empowerment programmes. (11.7%) home-makers who were aware of *Ujjawala (10.0) and MNAREGA (47.0),* respectively. However, 15.0 per cent women started using women friendly technologies in their households for drudgery reduction and hence improving their quality of life. Further, only 3.0 % of the respondents was making use of credit facilities for starting their own enterprise to supplement family income as they were completely ignorant about various schemes. Schemes like Widow Pension Scheme, Maternity Benefits and Girl Child Benefits were fully utilized as these provide direct economic gains.

**Keywords:** Awareness, Women empowerment. Rural households, Development programmes

Journal of Plant Development Sciences Vol. 12(7)

## IDENTIFY THE NEEDS AND BENEFITS FOR CREATION OF SELF HELP GROUP

**Victor Sarkar, Biman Maity*, Kausik Pradhan, Tarun Kumar Das and Ankur Adhikary**

*Department of Agricultural Extension,*
*Uttar BangaKrishiViswavidyalaya, Pundibari*
*Cooch Behar, West Bengal-736165*
*Email: biman100002@gmail.com*

*Received-30.06.2020, Revised-25.07.2020*

**Abstract:** Self Help Groups are small economically homogeneous group of the rural and urban women and poor. The study was conducted in Falimari and Chandamari village under Cooch Behar block I, Gopalpur, Takargach villages under Cooch Behar block II of Cooch Behar District, from each village 45 no. of respondents taken and total 180 no. of respondents are taken from the exhaustive list.The purposive and random sampling procedures were followedand collected data was analyzed with help of statistical tools for graphical representation of the results. The result shows that majority of the respondent had joined the Self-Help Group for promoting saving because most of the Self-Help Group members belong to poor family background and they have always financial shortage. 88.89% of the respondents are acquired money for the food security purpose. The finding indicates that the earning and saving money is the main factor of SHG members in the group which help them for empowerment and maintenance livelihood.

**Keywords:** Development, Empowerment, Income Generation, Livelihood, SHG

Journal of Plant Development Sciences Vol. 12(7)

## ON WHEAT (*TRITICUM AESTIVUM* L. EM THELL.) BREEDING

**Shri Niwas Singh* and Utkarsh Tiwari**

*Department of Genetics & Plant Breeding,*
*B.R.D. P.G. College, Deoria , Uttar Pradesh – 274001, India.*
*Email: singhshriniwas769@gmail.com*

*Received-04.07.2020, Revised-26.07.2020*

**Abstract:** A small data set on wheat breeding is used here to demonstrate a nonparametric statistical analysis to select desirable plant types. Only six varieties in three replications were evaluated on nineparameters. The proposed selection procedure has the flexibility to consider any combination of parameters and gives a preference order of selected plant types. The selection was carried out in two steps: 1. calculation of ranks of each genotype and summing the ranks to find cumulative ranks, and 2. normalizing the cumulative ranks by minimum value to find a preference order of genotypes by sorting the normalized cumulative ranks. The two steps are represented by the following set of two formulae: 1. $CR = \sum_{i=1}^{n} Ri$ and 2. NCR = CR/$CR_{min}$, where, CR = cumulative rank; NCR = normalized cumulative rank; R = Rank; n = number of parameters/characters evaluated. The values of NCR range from one to $CR_{max}/CR_{min}$. The higher valuesof NCR indicate the worst genotypes and range is an indicator of diversity evaluated. The NCR values near one indicate the most desired genotypes. In this example, the whole preference order is 1. HD3086, 2.Goal, 3.HD2967, 4.PBW502, 5.PBW343 and 6.NABI-BW.Crisscross planting, flowering synchronization and suitable modifications in crossing technique were also suggested for wheat breeding.

**Keywords:** Crop ideotype, Normalized cumulative ranks, Selection, Wheat breeding

Journal of Plant Development Sciences Vol. 12(7)

# CONSERVING TRAIT SPECIFIC GERMPLASM OF MEDICINAL PLANTS– CATERING TO NEEDS OF PHARMACEUTICAL INDUSTRIES

**Veena Gupta***

*Division of Germplasm Conservation,*
*ICAR-National Bureau of Plant Genetic Resources,*
*Pusa Campus, New Delhi 110012,*
*Email veena.gupta@icar.gov.in*

*Received-08.07.2020, Revised-27.07.2020*

**Abstract:**Medicinal plants sector continues to be the multi-billion dollar market globally. Since transgenic medicinal plants are not accepted in the herbal sector, classical breeding approaches are the only option for the crop improvement programmes. India having about eight per cent of world's biodiversity including the medicinal plant genetic resources, has the potential of becoming a major global player in market for medicinal plants based herbal formulations, medicines and products. As the demand for herbal medicines is growing in developing countries and consumers in developed countries are averted with modern medications are seeking alternatives medicines. It has also revived the interest by the multinational pharmaceutical industry in bio-prospecting (Singh, 2006).

**Keywords:** Cultivation, Herbal medicine, Medicinal plants