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Contents

RESEARCH ARTICLES

SHORT COMMUNICATION

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STUDIED ON DIVERGENCE ANALYSIS, HERITABILITY AND GENETIC ADVANCE FOR QUANTITATIVE TRAITS IN BLACK GRAM (*VIGNA MUNGO* L.)

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Abstract: The present experiment entitled "Studied on divergence analysis, heritability and genetic advance for quantitative traits in black gram (*Vigna mungo* L.) was conducted at Field Experimentation Centre, Department of Genetics and Plant Breeding, Sam Higginbottom University of Agriculture Technology and Sciences, Allahabad during *kharif*2017 in Randomized Block Design with three replications. The present investigation was prevailed to examine the 41Blackgram genotypes along with one check (T-9) to study the variability, heritability, genetic advance and divergence. Analysis of variance showed highly significant differences among 41 Blackgram genotypes all the 13 quantitative characters studied. Maximum GCV and PCV were recorded for harvest index,seed yield/plant, clusters per plant. High heritability was recorded for days to maturity, pods/plant, days to 50% flowering, seeds yield/plant,biological yield /plant. High heritability coupled with high genetic advance as percentage of mean was recorded for harvest index. Genetic diversity estimated in 41Blackgram genotypes using Mahalanobis's D^2 statistic. Forty-one genotypes were grouped into seven clusters by tocher method (Mahalanobis Euclidean Distance) cluster analysis. The maximum inter-cluster distance was observed between cluster VI and cluster VII. The maximum intra-cluster distance was observed in cluster VI. Cluster VI showed maximum cluster mean value for seed yield per plant among all characters cluster per plant, seeds per pod, harvest index contributes maximum.

Keywords: Divergence analysis, Genetic Diversity, D^2 statistic, Cluster

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DEVELOPMENT AND MODIFICATION OF BROAD BED FURROW MACHINE WITH WEEDER ATTACHMENT FOR WATER STRESSED CROP

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Abstract: Farmers follow traditional methods for sowing water stress crop. Some farmers used seed drill to sow water stress crops, but the yield of water stress crops was reduced due to improper drainage of the field. To solve these issues, a broad bed furrow machine powered by a tractor has been developed and evaluated. The method of water stress crop sowing is gaining popularity sowing to its main advantages is saving in irrigation water and other critical farm input as compared to sowing on flat fields. Mechanical management of weeds allows farmers to reduce or even eradicate the use of herbicides and contribute to a better climate. Once covered by moving dirt, weeds are mostly killed during mechanical weeding; hence for weeding with the broad bed furrow machine weeders are attached.The actual seed application rate with fluted exposure of broad bed furrow machine was 18 mm and 27 mm,also the actual fertilizer application rate was calculated. Field performance was evaluated by field capacity was 0.37 ha/hr, field efficiency was 68.5%, Weeding index of the machine was 70%. The functional performance of different system of seed drill was satisfactory during field. Seed drill gives fairly uniform row to row spacing.

Keyword: Broad bed furrow machine, Design of weeder attachment, Water stress crop, Efficiency

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ECONOMIC ANALYSIS OF POST HARVEST LOSSES AND THE DETERMINANTS OF POST HARVEST LOSSES OF RICE AND WHEAT AT FARM LEVEL

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Abstract: The present Study was an effort to portray the extent of post harvest losses in rice and wheat in physical as well as in monetary terms and to examine the determinants of these losses so that possible measures could be taken to check these losses. Multi-stage sampling design was adopted for the study. Chhattisgarh state consists of three zones i.e. Northern hills, Chhattisgarh Plain and Bastar Plateau. As Chhattisgarh plain zone has about 73.45% of total area of Wheat and 69.92% area of paddy in Chhattisgarh, thus, Chhattisgarh plain zone has been selected purposely for the present study. The study was carried out in Rajnandgaon district. Pre tested schedule was used to collect data from 100 paddy growing farmers and 100 wheat growing farmers from 10 villages of Rajnandgaon and Dongargarh block (5 blocks each). Post harvest losses in paddy were estimated to be 4.63 kg/q and 180.48 kg/ ha whereas losses in wheat was found 3.12 kg/q and 50.73 kg/ha at farm level. Value to total post harvest losses in paddy and wheat was found 2454.59 and 735.60 Rs per hectare respectively. Losses in rupees per quintal were also worked out which was found 62.97 rupees per quintal in paddy and 45.24 rupees per quintal in wheat. Area, education, age, storage facilities and timely labour availability were the determinants of post harvest losses in paddy found negatively significant. In case of determinants of post harvest losses of wheat, crop yield was found positively significant while timely labour availability was found negatively significant.

Keywords: Post harvest losses, Paddy, Wheat, Determinants of post harvest losses

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STUDIES ON PARAMETERIZATION, OPERATION AND MAINTENANCE OF SOLAR POWER PLANT

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Abstract: Solar energy is clean, inexhaustible and environment friendly potential resource among renewable energy options. But neither a standalone solar photovoltaic system nor a wind energy system can provide a continuous supply of energy due to seasonal and periodic variations. Therefore, in order to satisfy the load demand, off grid energy systems are now being implemented that combine solar and conventional conversion units. In one minute, the sun provides enough energy to supply the word's energy needs for one year. In one day, it provides more energy than the world's population could consume in 27 years. The energy is free and supply is unlimited. All we need to be find a way to use it.

Keywords: Operation, Parameterization, Solar power plant

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COST EVALUATION OF PESTICIDE AGAINST MAJOR PEST COMPLEX OF PADDY CROP IN JANJGIR-CHAMPA DISTRICT OF CHHATTISGARH

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Abstract: The study was conducted at the prone area of different villages in Janjgir-Champadistrictof Chhattisgarh. During 2009&2010, On basis of overall the average cost of pesticides evaluated against major pest complex of paddy was ranged from Rs 50.56 to 748.42during 2009. Whereas, during 2010, the average cost of pesticides was ranged from Rs. 00.00 to 994.15 with the cost of share was 00.00 to 40.72 percent. Pooled pesticide cost of major pest complex was ranged from Rs. 00.00 to 871.28. The maximum cost (Rs. 871.28) was recorded against SB followed by HC (Rs.579.24) and minimum (Rs. 00.00) in GB with the cost of share was 39.29, 26.12 and 0.00 percent, respectively.Descending order of the average pesticide cost of major pest complexin paddy crop can be ranked as GM<GB<O<CW<HC<SB.On the basis of information collected from the contact farmer through personal interview, some possible reasons comes out which may be the maximum respondentsinvested cost against SB followed by HC on paddy cultivation which causesmajor problems in that areaandoccurring every season which causing a perceptible damage to rice.

Keywords: Paddy cultivation, Pesticides, Cost and return, Plant protection cost, Pest complex of paddy return

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ESTIMATE THE CORRELATION AMONG THE YIELD AND YIELD COMPONENT CHARACTER IN BLACKGRAM [*VIGNA MUNGO* (L.)]

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Abstract: The experimental material was consisting of 41 Black gram genotypes, check as T-9, during kharif 2017. The experiment was out in Randomised Complete Block Design with 3 replications at field experimentation centre of Department of Genetics and Plant Breeding, Sam Higginbottom University of Agriculture, Technology & Sciences. The observations were logged on five randomly taken plants to each treatment and replication for 13 quantitative characters viz. days to 50% flowering, days to 50% pod setting, plant height, number of primary branches per plant, clusters per plant, pods per plant, pod length, seeds per pod, days to maturity, seed index, biological yield, harvest index and seed yield to estimate the variability, heritability and genetic advance as % mean, character association and path analysis. High heritability along with high Genetic advance as % mean was observed for harvest index and seed yield per plant represents simple selection is effective to improve these characters. The correlations revealed that harvest index, seeds per pod ,days to 50% pod setting, pods per plant, days to 50 % flowering, seed index and biological yield have the significant positive association with the seed yield per plant at both genotypic and phenotypic levels. The path analysis revealed that the harvest index, biological yield, days to 50 % flowering, plant height, pod length and clusters per plant had shown the true relationship with seed yield by establishing the positive correlations and direct effects at both genotypic and phenotypic levels, while branches per plant and days to maturity at genotypic levels and pods per plant and seeds per pod at phenotypic levels.

Keywords: Black gram [*Vigna mungo* (L.) Hepper], Genetic variability, Correlation, Path analysis

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ASSESSMENT OF OCCURRENCE, SEVERITY AND MANAGEMENT OF MAJOR DISEASES IN SCENTED RICE CULTIVARS BY THE TRIBAL FARMERS OF JASHPUR DISTRICT, CHHATTISGARH

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Abstract: Chhattisgarh is having large variability and diversity due to its topography and ecological situations. Among several crops and cultivars, farmers are generally cultivating rice with variety of practices and methods. The cultivation of scented rice varieties is one of the oldest practices. Looking to the changing consumer preferences, the demand of the scented rice is increasing day by day. The availability of scented rice in comparison to the demand is meager due to low productivity and susceptibility to several biotic and a-biotic stresses. Infestation of diseases is one of the important factor caused reduction in the productivity of scented rice. In this perspective the present study was undertaken in Jashpur district of Chhattisgarh with data collected from 144 scented rice growing farmers. The findings shows that, majority of the respondents perceived that Blast, BLB, False smut, Sheath rot and brown spot, in order are the major diseases causing yield loss in scented rice varieties. Accordingly it was found that the severity of blast was highest and brown spot was lowest. With regard to occurrence of disease, the respondents reported that blast and false smut were regularly occurred diseases than others. The yield loss caused due to these diseases is never more than 25 per cent. Remarkably, it was found that few farmers follows the disease management practices and only about 1 per cent scented rice growers were using fungicides for the management of diseases. It shows a complex situation which has to be overcome by incorporating strategic extension approaches so that the disease management can be done effectively to increase the productivity and profitability from scented rice cultivation.

Keywords: Scented rice, Disease management, Yield loss, Productivity

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TIME SERIES ANALYSIS MODEL TO FORECAST RAINFALL FOR JAGDALPUR REGION (CHHATTISGARH)

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Abstract: The prediction of Rainfall on monthly and seasonal time scales is not only scientifically Challenging but is also important for planning and devising agricultural strategies. Various research groups attempted to predict rainfall on a seasonal time scales using different techniques. This paper describes the Box-Jenkins time series seasonal ARIMA (Auto Regression Integrated Moving Average) approach for prediction of rainfall on monthly scales. ARIMA model (0, 0, 0) (0, 1, 1) for rainfall was identified the best model to forecast rainfall for next 4years with confidence level of 95 percent by analyzing last 27 year's data (1990-20016). Previous years data is used to formulate the seasonal ARIMA model and in determination of model parameters. The performance evaluations of the adopted models are carried out on the basis of correlation coefficient (R^2) and root mean square error (RMSE). The study conducted at Jagdalpur, Chhattisgarh (India). The results indicate that the ARIMA model provide consistent and satisfactory predictions for rainfall parameters on monthly scale.

Keywords: Rainfall,ARIMA, Correlation Coefficient (R^2), Root Mean Square Error (RMSE)

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PERFORMANCE EVALUATION STUDIES ON ICAR-NRRI, CUTTACK DEVELOPED TWO ROW POWER WEEDER

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Abstract: Rice is the most important crop in India. Mechanization in farming is always helpful to improve the productivity of the field. Weeding is a most problematic operation and solution of the weeding operation is very important. A two row power operated mechanical weeder was developed in ICAR-NRRI, Cuttack. Performance of the developed weeder is observed in terms of weeding efficiency, plant damage, cost of operation etc.

Keywords: Mechanical weeding, Weeding efficiency, Plant damage, Cost of operation

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FORAGING BEHAVIOR OF ITALIAN HONEY BEE, *APIS MELLIFERA* (HYMENOPTERA-APIDAE) IN BROCCOLI FLOWERS

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Abstract: The observation was undertaken at Raj Mohini Devi College of Agriculture and Research Station, Ambikapur of Indira Gandhi Krishi Vishwavidyalaya Raipur (Chhattisgarh) for foraging behavior of Italian honey bee in broccoli flowers during 2018-19.The foraging activity of Italian bee was observed maximum at 10.00AM (43.30 bee/5min/m^2) followed by at 12.00Noon (21.57 bee/5min/m^2) and at 08.00AM(13.42bee/5min/m^2) however the minimum activity was recorded at 2.00 PM (12.55 bee/5min/m^2).

Keywords: Broccoli flower, Foraging behavior, Italian bee, *Apis mellifera*

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IMPACT OF FOREST RIGHTS ON VALUE OF MELGHAT LANDSCAPE

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Abstract: The forest rights act 2006 has created considerable ethos among conservationists since its enactment. The present study is an attempt to value the forest loss due to land allotments under forest rights act in melghat forests. The value of forest landscape is referred from earlier researches and the loss of value is quantified with respect to land allotments data with forest department. The loss is compared with gains from cultivation. The gains of 7.07 crore by farmers are reported much scanty as compared to forest land loss of 447 crore rupees. Considering huge loss apart from fragmentation of ecosystem, the forest right allotments needs to be clubbed and re-settled to get undisturbed habitat.

Keywords: Forest rights, Community rights, Growing Stock