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## DROUGHT RESISTANCE PARAMETERS AS SELECTION PARAMETERS TO IDENTIFY DROUGHT TOLERANT RICE GENOTYPES

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**Abstract:** Multidimensional effect of drought on rice cultivation in Asia is a recurring climatic event. about 4.62 and 6 million ha area of rice in India in year 2002 and 2009, respectively had been reduced alone due to drought. The development of high yielding drought tolerant rice varieties for diverse nature of drought prone upland ecology is still in its infancy and germplasm still needs to be improved in rainfed eastern India. Considering this, this study has been done to evaluate early maturing genotypes over the season for upland areas of sufficient and deficit moisture regimes. Twenty seven genotypes in advanced yield trial less than 100 days (AYTLT 100 days) were tested for drought tolerance and yield performance. Results showed that Genotype x environment interaction accounted for 32 per cent of the total sum of squares, with environment and genotype responsible for 25 per cent and 43 per cent. There was also significant variation in the delay in flowering among drought stressed genotypes in which flowering time was similar under irrigated condition. Similarly, significant genotypic differences in Drought susceptibility index (DSI) based on grain yield ( $t\ ha^{-1}$ ) in each year was also observed. Yield reduction was above 50 per cent except Lalsar in all the environments, while, yield reduction varied from 83.33 per cent in Brown Gora up to 99.28 per cent in RR 366-5 under severe drought stress. In case of desirable stability factor, among the genotypes, only Lalsar followed by CR 143-2-2 showed desirable stability factor for grain yield ( $t\ ha^{-1}$ ). Results also revealed that 66 out of 78 estimates of correlations assumed significant in all the years and out of 66 estimates of significant correlations, forty two had positive sign and fourteen were negative, mostly estimates were common in nature and led to similar inferences in all the years. Furthermore, the biplot analysis for indices showed that drought resistance parameters and their interaction with drought tolerance parameters were highly significant ( $P < 0.001$ ) and accounted for 94.6 and 3.6 per cent of the treatment combination sum of squares, respectively.

**Keywords:** Drought, DSI, DTE, G X E interaction, rice, biplot analysis

## PERFORMANCE OF GARLIC GENOTYPES FOR THRIPS AND PURPLE BLOTCH RESISTANCE

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**Abstract:** A field experiment was conducted to screen the different garlic genotypes against thrips infestation at Department of Vegetable Science, College of Horticulture, Kolar during Rabi season of 2016-17. Out of twenty six genotypes, Yamuna Safed, Ranabennur Local, Jamnagar Local, Mandsaur Local, GN-14-01, Ooty Local and Baram Local-06 were recorded thrips population less than 6.93 per plant and were categorized as resistant. While, genotypes viz., Bhima Purple, Yamuna Safed-2, Yamuna Safed-3, Yamuna Safed-4, Yamuna Safed-5, Yamuna Safed-8, Yamuna Safed-9, Baram Local-06, Jamnagar Local, Mandsaur Local, Ranabennur Local, Ooty Local, GRS-1330, GN-14-25, GN-14-15, DWG-2 and DWG-1 (check) were found to be resistant against purple blotch disease.

**Keywords:** Garlic, Genotypes, Thrips, Purple blotch

## **EFFECT OF BEST PLANT BIO-REGULATORS AND MICRONUTRIENT FOR ACHIEVING HIGHER YIELD AND QUALITY OF MANGO (*MANGIFERA INDICA* L.) FRUITS CV. AMRAPALI**

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**Abstract:** An investigation was carried out on 19 years old plantation of mango (*Mangifera indica* L.) cv. Amrapali at C.S.A.U.A.&T., Kanpur (U.P.) India, during the year 2013-2014. In all, 15 treatments foliar application of plant bio-regulators and micronutrient were tested in RBD design replicated thrice. The result obtained revealed that the foliar application of GA<sub>3</sub> (40 ppm) + ZnSO<sub>4</sub> (1.0%) results in significantly more fruit length, fruit width, fruit weight and pulp per cent with decrease in stone per cent. Increased total soluble solids (<sup>o</sup>Brix), total sugars (%), ascorbic acid (Vitamin C) were also found maximum with the same treatment viz., pre-harvest application of GA<sub>3</sub> (40 ppm) + ZnSO<sub>4</sub> (1.0%) and acidity in the fruit was drastically reduced under this treatment.

**Keywords:** Mango, GA<sub>3</sub>, NAA, Zinc sulphate, Yield, Quality

## **CROPPING PATTERN AND ECONOMICS OF CEREALS PRODUCTION IN DIVERSE SEASONS OF UTTARAKHAND HILLS**

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**Abstract:** This study was aimed at identifying cropping pattern in Uttarakhand state and analyzing cost, return and profitability of cereals in different seasons. The study is based on the both primary and secondary sources and has made use of the farm level cross-sectional data collected through multistage random sampling technique from 200 sample farmers belonging to different hill altitudes. To estimate cost major inputs like labor, farmyard manure, fertilizer, seeds, animal feed etc were identified and valued at the prevailing market rates. Returns were estimated by multiplying quantities produced of particular crop and current market prices. Results indicated a cropping intensity of 188% and the cereal crops accounted for around 70% of the gross cropped area. Wheat emerged as the main food grain crop in the study area with its percentage share of 26.98% in the gross cropped area, while paddy (24.21%) was the second major cereal crop in the study area. The cost of cultivation of cereals summer season (₹ 11704/acre) was slightly less than that of cereals in winter season (₹ 11866/acre). Per acre net return from cereals was found to be higher for winter season (₹ 11237.7/acre) when compared to wheat summer season (₹ 8420.37/acre).

**Keywords:** Cereals, Cropping pattern, Cost of cultivation, Net returns, Seasons

## **GROWTH AND YIELD OF CITRONELLA (*CYMBOPOGON WINTERIANUS*) AS INFLUENCED BY DIFFERENT RESIDUAL FERTILITY LEVELS AND INTERCROPPING WITH LENTIL AND LINSEED**

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**Abstract:** A field experiment was conducted at, student Instructional Farm (SIF) Chandra Shekhar Azad University of Agriculture and Technology, Kanpur (U.P.) India during rabi season 2013-14. with an object to find out the effect on growth parameters and yield attributes of linseed and lentil as intercrops, with citronella (*Cymbopogon winterianus*). The experiment was laid out in randomized block design with 9 cropping system with different combination [sole citronella, sole linseed, sole lentil, citronella + linseed (100%), citronella + linseed (75%), citronella + linseed (50%), citronella + lentil (100%), citronella + lentil (75%), citronella + lentil (50%) each replicated four times (once in each replication). The citronella sole cropping system gave significantly the highest citronella equivalent oil yield than other cropping systems. Citronella + Linseed (50%) treatment ranked next in order of merit, proving significant better than other cropping system. Citronella + Lentil (100%) ranked next in order of merit, proving significant superior over other cropping system. Citronella sole brought about 57.35 (30.30%), 61.63 (33.32%), 84.56 (52.04%), 85.35 (53.09%), 90.45 (57.93%), 92.69 (60-63%), 179.27 (266.37%) and 192.80 (258.56%) lit/ha higher citronella equivalent oil yield than citronella + linseed (100%), citronella + linseed (75%), citronella + linseed (50%), citronella + lentil (100%), citronella + lentil (75%), citronella + lentil (50%), linseed sole and lentil sole respectively. LER was more than sole crops which showed an advantage of intercropping over sole system in terms of the use of environment resources for plant growth and development. LER values in citronella + linseed (75%) and citronella + linseed (100%) intercropping system was 1.34.

**Keywords:** Residual fertility, LER, Citronella, Growth parameters, Yield attributes

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## **INFLUENCE OF DIFFERENT PRE-TREATMENTS METHODS ON SEED GERMINATION AND SEEDLING GROWTH PERFORMANCE OF GOLDEN SHOWER TREE (*CASSIA FISTULA* L.)**

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**Abstract:** The present study was conducted to find out the effect of different pre-treatments method on seed germination and seedling growth performance of Golden Shower Tree (*Cassia fistula* L.) at Forest nursery and Research Centre, SHUATS, Allahabad, India, during the month of June – September 2018. The seeds were pre-treated with different methods such T<sub>0</sub>- Control, T<sub>1</sub>- hot water 20 min + soaking in cold water 12 hrs, T<sub>2</sub>- cold water 24 hrs, T<sub>3</sub>- IAA 200 ppm 12 hrs, T<sub>4</sub>- IBA 200 ppm 12 hrs, and T<sub>5</sub>- Conc H<sub>2</sub>SO<sub>4</sub>- 2 Min+ 16 Hrs soaking in cold water and sown in poly bags filled with FYM 2:1:1 at Completely Randomized Design. The results indicated the maximum Germination percentage (78.89), Number of leaves (6.49) at 30 DAS, 7.29 AT 60 DAS, 9.21 at 90 DAS, shoot height (25.25 cm) at 90 DAS, root length (17.77cm), fresh shoot weight (7.27g), dry shoot weight (3.82g), fresh root weight (4.38g), dry root weight (2.78g) and vigour index (121.89) recorded in T<sub>5</sub>. However T<sub>0</sub> Control had no germination. Therefore, the results showed that the best pre-treatment method T<sub>5</sub> was more effective in germination and significantly improved the growth parameters as well as the quality seedling of *Cassia fistula* L.

**Keywords:** *Cassia fistula*, Pre-treatment, Seed germination, Seedling growth

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## **STUDIES ON THE EFFECT OF WEATHER CONDITIONS ON INFESTATION OF MAIZE STEM BORER *CHILO PARTELLUS* SWINEHOE, AND SORGHUM SHOOT FLY, *ATHERIGONA SOCCATA* RONDANI, ON MAIZE, *ZEA MAYS* L.**

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**Abstract:** The present investigation was conducted at Students' Instructional Farm (SIF) of Chandra Shekhar Azad University of Agriculture and Technology Kanpur, (U.P.) during *Kharif*- 2016 and 2017 to study the infestation of maize stem borer and sorghum shoot fly in relation with biotic factors viz. maximum and minimum temperature, relative humidity and rainfall. The incidence of maize stem borer increased gradually and reached to peak with 28.10 per cent and 27.80 per cent infestation in 53 days (33<sup>rd</sup> SMW) and 53 days (33<sup>rd</sup> SMW) in *Kharif* season during both the year i.e. 2016 and 2017, respectively. Similarly the formation of dead heart of sorghum shoot fly increased gradually and reached to peak in tune of 22.60 per cent and 20.80 per cent in 34 days (30<sup>th</sup> SMW) and 34 days (30<sup>th</sup> SMW) during 2016 and 2017, respectively. The maximum pest population was trapped during 3<sup>rd</sup> week of August (33<sup>rd</sup> SMW) in both years, when the maximum temperature i.e. 31.70 °C and 34.30 °C and minimum i.e. 25.50 °C and 26.10 °C, respectively, were recorded and relative humidity of 84.60 per cent and 77.00 per cent, respectively, and total rainfall i.e. 33.10 and 27.80 mm. respectively, were observed. The maize stem borer and sorghum shoot fly incidence in the form of dead heart was correlated with the meteorological parameters of corresponding period of observations.

**Keywords:** Maize stem borer *Chilo partellus* Swinehoe, Sorghum shoot fly, Seasonal incidence, *Zea mays* L.

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## ASSESSING VARIABILITY IN MORPHOLOGICAL TRAITS OF JAMUN (*SYZYGIVM CUMINI* (L.) SKEELS) GENOTYPES

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**Abstract:** The indigenous future fruit 'Jamun' is grown throughout the tropical and subtropical regions of the country. Since vast genetic variability exists among the seedling populations, characterizing the germplasm to identify superior genotypes is essential for jamun crop improvement. In this background, morphological characterization of 14 jamun genotypes to know the variability was studied in randomized block design with three replications. Significant variability was observed for tree morphological traits such as plant height, canopy spread and leaf petiole length and fruit characters fruit length, fruit width and seed length. Variations were also observed on date of flower initiation, number of flowers and fruits set per panicle. Among the genotypes, a few with bold fruits with comparable TSS and pulp content, lesser plant height and canopy spread and early initiation of flowering such as IIHRJ-3, IIHRJ-14 and IIHRJ-12 were found as superior clones for utilizing the jamun crop improvement programs.

**Keywords:** Jamun, Morphological traits, Genotypes, *Syzygium cumini*

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## EFFICACY OF PLANT DERIVED ESSENTIAL OILS AGAINST *SITOPHILUS* *ORYZAE* (L.) IN STORED WHEAT GRAINS

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**Abstract:** Certain plant derived essential oils are known as a source of secondary metabolites and used as insecticides to repel insects. As part of an effort aimed at the development of reduced-risk pesticides based on plant essential oils, the toxicity of essential oils was investigated against rice weevil *Sitophilus oryzae* L. under laboratory conditions i.e. 28±2°C temperature, 60±5% relative humidity and a 16:8 light:dark photoperiod in BOD. The treatments were the essential oil from various botanicals i.e. Eucalyptus (*Eucalyptus globules*), Lemongrass (*Cymbopogon citrates*), Citrus (*Citrus maxima*) and

their different combinations. Data was recorded for various parameters viz. per cent adult mortality, grain damage, weight loss and progeny emergence. Study revealed that the combination of essential oils of Eucalyptus (0.5 %) + Lemon grass (0.5 %) was found to be significantly superior among all the treatments and recorded consistently increased rate of adult mortality 61.67, 78.33 and 96.67 % after 7, 14 and 21 days and progeny emergence 60.28, 56.17 and 54.78, respectively. This treatment also recorded with minimum loss in weight and minimum grain damage after 75 days of insect release. The minimum adult mortality, maximum grain damage and maximum weight loss were recorded in control. The validated information provides ample scope for the use of essential oils against store grain pests.

**Keywords:** Wheat, *Sitophilus oryzae*, Management, Essential oils

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## ASSOCIATION BETWEEN FARMERS' PERSONALITY TRAITS AND AWARENESS TOWARDS SOIL PARAMETERS

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**Abstract:** The present study was carried out to study the socio-economic profile and awareness level about soil parameters of respondents. Haryana is divided into two Agro-Climatic zones such as North Eastern Zone and South Western Zone. From each zone two districts will be selected purposively viz. Kurukshetra and Karnal from North-Eastern zone and Bhiwani and Rewari from South-Western zone. Total sample size of 240 respondents was selected for collecting the data. The majority of the respondents were middle age group, 90 per cent were literate from primary to graduate or above and maximum 49.17 percent respondents had medium Socio-economic status (SES). Majority of the respondents had low mass media exposure and extension contacts. Respondents had high awareness about soil texture, soil colour and crops which are suitable for their soil. Education and SES were found significantly correlated with awareness of respondents about soil parameters.

**Keywords:** Awareness level, Soil parameters, Correlation, Farmers

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## SEASONAL INCIDENCE OF DIAMOND BACK MOTH, *PLUTELLA XYLOSTELLA* (L.) ON CABBAGE AT NORTHERN HILLS OF CHHATTISGARH

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**Abstract:** Seasonal incidence of diamondback moth *Plutella xylostella* L. on cabbage was conducted at three spots during winter season 2017-18. The result of experiments revealed that the pest was appeared from the 4<sup>th</sup> SMW (in the month of last January) with an average population of 1.7 larvae/plants at all locations and remained in the fields until the 14<sup>th</sup> SMW (in the month of April). The peak population of DBM was observed in 11<sup>th</sup> SMW with average population 7.4 larvae/plants at maximum and minimum temperature, 31.6°C and 16.2°C and relative humidity 69 per cent, respectively, thereafter the population started declining. The larval activity suddenly decreased with 0.7 larvae/plants in the 14<sup>th</sup> SMW (in the second week of April), during the period maximum and minimum temperature were increased and relative humidity also decreased.

**Keywords:** Cabbage, Diamondback moth, Seasonal incidence, Chhattisgarh