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PROSPECTS OF VALUE ADDITION IN INDIGENOUS FRUITS OF ASSAM –A MINI REVIEW

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Abstract: The north eastern region of India, particularly Assam is one of the biodiversity hotspots and is considered as the centre of origin of certain crop species like citrus, banana etc. Many of the minor and indigenous fruits are found in Assam which grows wild and found also in homestead (Bari) garden. These fruits are nutritious, possesses medicinal and therapeutic properties. There are immense potentialities of preparation of high nutritive value products from these crops through processing and value addition. Among the different indigenous minor fruits viz., Kordoi (*Averrhoa carambola* Linn.), Outenga (*Dillenia indica* Linn.), Bhimkol (*Musa balbisiana* L.), Rebabtenga (*Citrus grandis* L), Mirikatenga (*Parameria polyneura* Hk.f.), Amlakhi (*Phyllanthus emblica* Linn.), Kujithekera (*Garcinia cowa* Roxb.), Bael (*Aegle marmelos* Correa), Roselle fruit (*Hibiscus sabdariffa* L.) , Borthekera (*Garcinia pedunculata* Roxb.), Jack fruit (*Artocarpus heterophyllus* Lam.), Jamun (*Syzygium cumini* Linn.(Skeels), Nagatenga (*Rhus semialata* Murr.) have high potential for value addition. These fruits are mostly consumed by the local people as fresh as well as processed products. 'Ready to serve' (RTS) beverages can easily be extracted from ripe fruits of Outenga, Kordoi, Bael. Jam, jelly, squash may be prepared from ripe fruits of Kordoi, Outenga, Kujithekera, Roselle, Nagatenga, Bhimkol. Good quality pickles could be made available from Amlakhi, Kujithekera, Borthekera, Mirikatenga. Delicious juices could be prepared from Bael, Kordoi, Rebabtenga. From ripe Jack fruit bulbs jackfruit toffee, lather and jam can be prepared as well as from the seeds of jackfruit; good quality flour can be prepared. Wines can also be prepared from ripe Jackfruit, Jamun and Roselle. Sweet candy may be prepared from Amlakhi, Kujithekera, Mirikatenga. Minimally processed ready-to-cook jack fruit can also be a business venture for the farmers. Thus, value addition in minor and indigenous fruits could be one of the appropriate options to enhance farmer's income in Assam.

Keywords: Minor, Indigenous, Fruits, Value Addition, Income

GENETIC VARIABILITY AND HERITABILITY STUDIES FOR YIELD AND QUALITY TRAITS IN WHITE AND BROWN FINGER MILLET (*ELEUSINE CORACANA* (L.))

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Abstract: The present investigation was conducted to assess the nature and magnitude of genetic variability for yield and quality related traits in 64 genotypes of finger millet for 25 parameters during Kharif, 2020 at Agricultural College Farm, Bapatla, Andhra Pradesh. The analysis of variance for square lattice design reported the existence of significant difference among the genotypes for all traits. The genotypic coefficient of variation for all the characters studied was less than phenotypic coefficient of variation indicating the influence of environment in shaping these traits. Moderate to high variability and high heritability accompanied with high genetic advance as per cent of mean were observed for 22 characters indicating the predominance of additive gene action in manifestation of these traits, and hence improvement can be anticipated by simple selection.

Keywords: Finger millet, Genetic advance as per cent of mean, Heritability, Variability

GENETIC DIVERSITY ANALYSIS IN ADVANCED BREEDING LINES (ABLS) OF RICE (*ORYZA SATIVA* L.) UNDER IRRIGATED LATE CONDITION

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Abstract: The present study was undertaken to estimate the nature and magnitude of genetic diversity among 53 diverse breeding lines of rice. The genotypes were grouped into 7 clusters based on Euclidean cluster analysis. The largest cluster, Cluster VI comprised of 17 genotypes followed by Cluster I comprised of 10 genotypes in it, Cluster IV and VI included 9 genotypes each. The maximum intra cluster distance was observed for Cluster VI and minimum for Cluster III. The maximum diversity was observed between the Cluster III and Cluster V while minimum diversity was observed between Cluster I and Cluster IV. There is maximum inter-cluster distance between Cluster I and V, hence the hybridization between the genotypes of these clusters will be rewarding and would generate maximum variability and transgressive segregants.

Keywords: Genetic diversity, Analysis of variance, Cluster analysis

OPTIMIZATION OF FACTOR AFFECTING *IN VITRO* SHOOT MULTIPLICATION OF *TERMINALIA ARJUNA*

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Abstract: Realizing the immense potential of *Terminalia arjuna* as a source of valuable medicine and considering its ever-increasing demand the present study was taken up to highlight the most crucial step of any micropropagation protocol i. e. *in vitro* shoot multiplication as it determines the availability of shoot stock for rooting or complete plantlet formation. With increase in shoot multiplication fold, success of micropropagation also increases. Thus, to maximize *in vitro* shoot multiplication many factors, in addition to plant growth hormone, are also important. Present study concluded that propagule size for subculture, type of growth medium, medium strength, carbohydrate source and subculture duration also affect shoot multiplication. Propagule with three shoots were cultured on modified MS medium (MMS) fortified with 4.44 μ M BAP + 0.54 μ M NAA + additives and 3% sucrose gave 3.7 fold shoot multiplication after 4 weeks.

Keywords: *Terminalia arjuna*, *In vitro* shoot multiplication, Modified MS medium, Propagule, Carbohydrate

PHYSIOLOGICALLY DIVERSE MORPHOTYPES OF *BACOPA MONNIERI* L. PANNELL

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Abstract: The aim of the experiment was to evaluate morphological and physiological variability among different accessions of *Bacopa monnieri*. Variation in leaf colour was reported in DBM-13, which exhibited exceptionally light green colour leaves as well as purple flower colour with least total chlorophyll content among studied accessions. A maximum number of leaves per stolon were reported by DBM-10, having the least leaf size and leaf area. The highest basal leaf area was reported in DBM-2, which is economically important for higher biomass content. Information on the extent of morphological variability among yield-related traits is a prime requirement for selection, trait improvement, and to design of a suitable breeding line.

Keywords: Leaf diversity, Chlorophyll content, Flower colour, Jal Brahmi

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ASSESSMENT OF GENETIC VARIABILITY, HERITABILITY AND GENETIC ADVANCE IN AROMATIC BREEDING LINES BASED ON YIELD AND GRAIN QUALITY TRAITS IN RICE (*ORYZA SATIVA* L.)

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Abstract: Fifty one aromatic lines of rice were evaluated during *kharif* (wet season) of 2020 to study presence of genetic variability. The genotypes differed highly significantly except for number of total tillers and flag leaf width. High phenotypic and genotypic coefficient of variation recorded for grain yield per plants, followed by harvest index, number of filled spikelets per panicle, number of spikelets per panicle, 1000 seed weight, alkali spreading value and number of effective tillers per plant. All character showed high heritability except for flag leaf width and number of total tillers per plant. Higher estimates of heritability with genetic advance as percent of mean was observed for number of filled spikelets per panicle, number of spikelets per panicle, harvest index, 1000 seed weight, alkali spreading value, spikelet fertility %, kernel L/B ratio, length breadth ratio, kernel length, plant height, head rice recovery %, grain length, gel consistency, days to 50% flowering, days to maturity, amylose content, flag leaf length and grain yield per plant. These characters are governed by additive gene action and selection can be operated well in the existing genotypes.

Keyword: Genetic variability, Heritability, Genetic advance, Rice

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IMPACT OF INTERCROPPING ON INCIDENCE OF MUSTARD WEB WORM (*CROCIDOLOMIA BINOTALIS* ZELL.)

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Abstract: The experiment was carried out at Research farm of BTC CARS, Bilaspur during *Rabi* 2019-20. A field experiment was laid down in randomized block design (RBD). A study was conducted on the intercropping of mustard with seven crops viz. Wheat, Onion, Garlic, Coriander, Sunflower, Safflower and Linseed against mustard web worm (*Crocidolomia binotalis* Zell.). Intercrop treatment, mustard + coriander was found most effective with minimum larval

population 4.23 larvae/plant, maximum 48.60 per cent reduction in larval population, second highest in mustard equivalent yield (3438.50 kg/ha) and with best benefit cost ratio(5.47:1), followed by mustard + safflower (5.66 larvae/plant), mustard + sunflower (6.00 larvae/plant) and mustard + onion (6.10 larvae/plant) with 31.22%, 27.09 % and 25.88 % reduction in larval population, respectively. The maximum larval population 8.23 larvae/plant and lowest benefit cost ratio(1.47:1) was recorded in control i.e. mustard sole crop.

Keywords: (*Crocidolomia binotalis* Zell.) Garlic, Coriander, Sunflower, Wheat, Onion

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ENHANCE THE PRODUCTIVITY OF RIDGE GOURD (*LUFFA ACUTANGULA* L.) CULTIVATION IN NET TRELLIS SYSTEM IN BARMER DISTRICT OF RAJASTHAN

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Abstract: To test and popularize the Krishi Vigyan Kendra, Barmer-II, Gudamalami, Rajasthan recommended Enhance the Productivity of Ridge gourd (*Luffa acutangula* L.) Cultivation in Net Trellis System in Barmer District of Rajasthan, On Farm Trials (OFT's) were conducted during the *kharif* season of 2019 and 2020 in farmers participatory mode at three locations in Barmer District of Rajasthan. The experiment consisted of two treatments *viz.*, recommended practice (Net trellis system) and farmers practice (Furrow). Net trellis system had significant increase number of picking (13), fruit length (43.33 cm) and fruit weight (210 g) as compared to farmer's practice (07, 22.67 cm and 101.5 g) during both the year as well as pooled data. The two year average fruit yields of net trellis system have shown doubled production over farmers practice method. Net trellis system was recorded increase yield for 73.57% (138.06 t/ha) as compared to farmers practice (79.54 t/ha) during both the year as well as pooled data. Similarly, the net returns and B:C ratio also revealed that maximum under net trellis system during both the year as well as pooled data Rs 232790 per hectare and 3.36:1 as compared to farmers practice Rs 89913.5 per hectare and 2.30:1. Net trellis system had significant reduce the damage of pest and soil borne diseases and improve the quality of fruits.

Keywords: Ridge Gourd, Net trellis system, On Farm Testing (OFT), Yield and B:C ratio

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EFFECT OF PLANTING GEOMETRY AND INTERCROPPING BASED STRATEGY ON PRODUCTIVITY AND FALL ARMYWORM MANAGEMENT IN WINTER MAIZE (*ZEA MAYS* L.)

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Abstract: A field experiment to explore the potential of maize and legume based intercropping systems under different treatments conducted during *Rabi* season of 2020-21 to evaluate the effect of eight treatments via. maize sole (70 x20 cm), maize + fenugreek (1:1), maize + coriander (1:1), maize + garlic (1:1), maize sole (50/90 cm), paired row maize + fenugreek (2:2) (50/90 cm), paired row maize + coriander (2:2) (50/90 cm) and paired row maize + garlic (2:2) (50/90 cm) on productivity and fall army worm management which were laid out in factorial block design with 3 replications. Row arrangement system significantly influenced the growth and yield of maize and paired row system was found superior over regular row. All the intercropping systems significantly influenced growth and yield attributing features of maize and where maize + coriander intercropping was superior over maize + fenugreek, maize + garlic and sole maize for yield attributes and

cob and grain yield of maize. While, maximum system productivity was obtained in paired row which was found significantly superior over regular row and maize + garlic intercropping was significantly superior over maize + fenugreek, maize + coriander and sole maize. The lowest FAW damage was also recorded with the paired row over the regular row. The maize + coriander intercropping system recorded minimum FAW damage over the rest of the intercropping system. Paired row + garlic had higher net return and B: C ratio found statistically comparable with paired row + fenugreek.

Keywords: Maize, Intercropping, System productivity, B:C ratio, Fall army worm

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IN-VITRO STUDIES ON COMPATIBILITY BEHAVIOR AMONG MICROBIAL INOCULANTS

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Abstract: The present study was conducted during 2017-19 at Department of Plant Pathology and Agricultural Microbiology, Post Graduate Institute, M.P.K.V., Rahuri-413722. All the microbes have to prove effective in colonization of the plant roots for efficient function under natural soil conditions. Compatibility between the PGPR microbes to colonize the root system without inhibiting each other is a pre-requisite for success of using multiple microbes in a crop field. In our study, among the different microbes tested for their compatibility in culture growth, the all species of bioinoculants were found to compatible the growth of other species as evident from the no zone of inhibition observed in the plates. All other microbes viz; *Trichoderma viride*, *Pseudomonas fluorescens*, *Azotobacter chroococcum* and *Bacillus polymyxa* on NA media were compatible with each other. These results have made us to choose the best two candidate bacteria for further studies.

Keyword: Bioinoculants, Compatible, PGPR microbes

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SURVEY FOR THE ASSESSMENT OF STEM AND ROOT ROT DISEASE INCIDENCE IN WESTERN RAJASTHAN

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Abstract: A survey was conducted in major sesame growing areas of Western Rajasthan viz., Pipar city (Jodhpur), Sojat (Pali), Samdari (Barmer) and Kheenvsar (Nagaur) of Western Rajasthan during *kharif* 2020 to assess the incidence of stem and root rot diseases. The highest incidence of stem and root rot of sesame was observed in Sojat tehsil (32.74%) whereas, the minimum stem and root rot disease incidence was observed (15.18%) in Samdari tehsil. The overall average disease incidence of the Western Rajasthan was 26 per cent based on total 100 fields surveyed in *kharif* 2020.

Keywords: Survey, Sesame, Stem and root rot, Disease incidence

SURVEY TO RECORD THE PEARL MILLET BLAST SEVERITY IN WESTERN RAJASTHAN

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Abstract: A survey was conducted in major pearl millet growing districts of Western Rajasthan during *Kharif* 2020 to record the severity of blast disease. The highest pearl millet blast severity was recorded in Nagaur district (43.4%) Whereas, the minimum blast severity was recorded (16.6 %) in Pali district. The overall average disease severity of Western Rajasthan was (28.12%) based on total 125 fields surveyed in *kharif*2020.

Keywords: Survey, Pearl millet, Blast, Disease severity

SURVEY AND ASSESSMENT OF SEVERITY OF EARLY BLIGHT (*ALTERNARIA SOLANI*) DISEASE OF TOMATO IN JODHPUR DISTRICT OF RAJASTHAN

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Abstract: Tomato (*Solanum lycopersicum* L) is most remunerative vegetable crop. It is infected by several pathogen among them early blight most devastating disease is considered to be a great threat to its production world widely. Assessment of disease severity is an important step and it helps in designing management strategies which help in increasing the crop yield. Therefore, a survey was conducted in tomato growing areas of different tehsils viz., Tinwari, Bilara, Bhopalgarh, Osian and Bawadi of Jodhpur district, Rajasthan during *kharif* 2020 to assess the intensity of early blight diseases. Among them the highest intensity of early blight of tomato was observed in Tinwari tehsil (32.35 %) followed by Osian (28.25%). Whereas, the minimum early blight intensity was observed in Bilara (12.04 %) tehsil. The overall average disease incidence of the Jodhpur district was (23.10 %) based on total 125 fields surveyed in *kharif*2020.

Keywords: Survey, Tomato, Early Blight, Disease Intensity, *Alternaria spp*