

# **Effect of Stages of Harvest and Nutrient Management Practices on Juice Yield and Juice Quality Parameters of Sweet Sorghum (*Sorghum bicolor*)**

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## **ABSTRACT**

A field experiment was conducted during *khari*f 2011 and 2012 to study the influence of nitrogen, potassium levels and stages of harvest on sweet sorghum for juice yield and its quality parameters. Among stages of harvest significantly higher stalk yield (42.0 and 40.3 t ha<sup>-1</sup>) brix (16.0 and 16.6%) sucrose (11.6 and 9.9%), Purity (59.2 and 72.5%) and maximum juice yield (17547 and 15662 L ha<sup>-1</sup>) were recorded at physiological maturity stage compared to other stages of harvest. Application of 120 kg N and 40 kg K<sub>2</sub>O ha<sup>-1</sup> resulted in significantly higher stalk yield (41.0 and 37.8 t ha<sup>-1</sup>), juice extraction (40.0 and 37.8%), Juice yield (19183 and 16848 L ha<sup>-1</sup>), brix (15.2 and 15.0%), sucrose (10.8 and 8.8%) and purity (57.2 and 71.0%). Application of higher dose of nitrogen and potassium nutrient levels did not prove significantly advantageous in all parameters. The lowest stalk, juice, brix, sucrose and purity were recorded with application of 60 kg N and 40 kg K<sub>2</sub>O ha<sup>-1</sup> at all the stages of sweet sorghum

**Key words :** Brix, Juice extraction, Purity, Sucrose, Sweet sorghum.

# **Effect of Seed Size on Crop Productivity in Groundnut (*Arachis hypogaea L.*)**

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## **ABSTRACT**

Field experiment was conducted on effect of seed size on crop productivity in groundnut at Regional Agricultural Research Station, Lam farm, Guntur in a factorial randomized block design during *Rabi*, 2009-2010. Results revealed that significant differences were observed among the varieties, seed sizes and their interaction effects. The plants from large seed exhibited higher values of field emergence (94%), number of primary branches (6.47), number of secondary branches (6.42), leaf area (981.06 cm<sup>2</sup> plant<sup>-1</sup>), total dry matter (25.48 g) as compared to plants from small and shriveled seeds. Varieties also differed significantly for the above characters. The plants from large seed recorded highly number of pods per plant (11.05), 100 seed weight (52.60 g) and pod yield (17.95 q ha<sup>-1</sup>) as compared to plants from small and shriveled seed. Among the varieties, Narayani recorded higher pod yield (20.49 q ha<sup>-1</sup>) followed by KADIRI-6 with (16.87 q ha<sup>-1</sup>) and JL-24 with (16.49 q ha<sup>-1</sup>).

**Key words :** Crop productivity, Groundnut, Seed size.

## **Tiller Dynamics, Yield and Yield Attributes of Rice Varieties to the Age of Seedlings**

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### **ABSTRACT**

A field experiment was conducted during *khariif* 2011 at Regional Agricultural Research Station, Warangal to find out the response of high yielding rice varieties to the age of seedlings with five ages of seedlings viz., 20, 30, 40, 50 and 60 days and three varieties i.e., BPT 5204, MTU 1001 and JGL 384. Tiller production was reduced by 43% with the advancement in the age of seedlings from 20 to 60 days. The age of seedlings also significantly influenced the yield attributes and yield except 1000-grain weight. The seedlings of 20 days old recorded higher yield attributes, grain yield, straw yield and net returns which was on a par with 30 days old seedlings, whereas lower values were recorded with 60 days old seedlings. The cultivar, MTU 1001 recorded higher panicles m<sup>-2</sup> and 1000-grain weight, where as tillers hill<sup>-1</sup> were maximum in BPT 5204 and number of filled grains panicle<sup>-1</sup> were maximum in JGL 384 with all the ages of seedlings.

**Key words :** Grain Yield, Net Returns, Tillers, Yield Attributes.

## **Growth and Pod Yield of Groundnut as Influenced by Cultivars and Times of Sowing Under Irrigated Conditions During Early *Khariif***

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### **ABSTRACT**

Field experiment was conducted on “Growth and pod yield of groundnut as influenced by cultivars and times of sowing under irrigated conditions during early *khariif*” at RARS Farm, Tirupathi during 2011. Greeshma and Dharani are the two cultivars used with six times of sowing starting from April 1<sup>st</sup> to June 16<sup>th</sup> at fortnightly intervals. Groundnut cultivars sown on May 16<sup>th</sup> recorded the highest pod yield (3397 kg ha<sup>-1</sup>), which was significantly superior over other times of sowing. The lowest pod yield of 1736 kg ha<sup>-1</sup> was recorded when groundnut was sown on June 16<sup>th</sup>. The interaction effect between varieties and time of sowing was found significant. Groundnut cultivars Dharani and Greeshma when sown on 16<sup>th</sup> May recorded the highest pod yields of 3514 and 3280 kg/ha respectively which was significantly superior over other dates of sowing. Both the cultivars recorded significantly the lowest pod yield when sown on June 16<sup>th</sup>.

**Key words :** Early *Khariif*, Groundnut cultivars, Greeshma, Dharani, Times of sowing and Pod Yield.

# **Influence of Seed Rate on Productivity and Economics of Promising Groundnut Varieties (*Arachis hypogaea* L.)**

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## **ABSTRACT**

A field experiment was conducted on sandy loam soils during *kharif* 2010 at College farm, College of Agriculture, Rajendranagar, Acharya N.G. Ranga Agricultural University to evaluate the effect of varieties and seed rates on yield and economics of groundnut. The treatments consisted of four groundnut varieties (Narayani, ICGV 91114, K 6 and JCG 88) and four seed rates (75, 100, 125 and 150 kg ha<sup>-1</sup>) laid out in Randomized Block Design with factorial concept three replications. Among the varieties, maximum pod yield of 1835 kg ha<sup>-1</sup> was obtained with Narayani followed by K 6 (1651 kg ha<sup>-1</sup>) variety. With each increase in seed rate from 75 to 150 kg ha<sup>-1</sup> there was corresponding increase in pod yield. Significantly higher pod yield was obtained with a seed rate of 150 kg ha<sup>-1</sup>. Interaction effect between varieties and seed rates revealed that significantly higher pod yield (2150 kg ha<sup>-1</sup>) was recorded with Narayani at 150 kg ha<sup>-1</sup> and followed by 125 kg ha<sup>-1</sup> and K 6 at 150 kg ha<sup>-1</sup> which were at par. However, JCG 88 recorded higher yields with a seed rate of 125 kg ha<sup>-1</sup>. The oil content was significantly influenced by varieties and JCG 88 recorded higher oil content which was at par with K 6 and Narayani varieties. Maximum gross returns (Rs.38535 ha<sup>-1</sup>), net returns (Rs.25632 ha<sup>-1</sup>) and benefit-cost ratio (1.98) were obtained with Narayani closely followed by K 6. Seed rate also significantly influenced the economics of groundnut. Gross returns, net returns and benefit-cost ratio increased with each increase in seed rate from 75 to 150 kg ha<sup>-1</sup>. However, at the seed rate of 125 and 150 kg ha<sup>-1</sup> there were no significant difference in gross, net returns and benefit-cost ratio. Thus for attaining economic pod yield, Narayani with a seed rate of 125 kg ha<sup>-1</sup> and K 6 with a seed rate of 150 kg ha<sup>-1</sup> would be advisable for cultivation under rainfed conditions of Southern Telangana zone, Andhra Pradesh.

**Key words :** Economics, Oil percent, Seed rate, Varieties.

# **Study of Estimates of Genetic Parameters for Yield and Physiological Traits in Rice (*Oryza sativa* L.) under Saline Soil Conditions**

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## **ABSTRACT**

Study of variability parameters in F<sub>2</sub> progenies of rice under saline soil conditions revealed high heritability estimates as well as genetic advance for number of total tillers plant<sup>-1</sup>, number of productive tillers plant<sup>-1</sup>, panicle length, panicle weight, number of filled grains panicle<sup>-1</sup>, spikelet fertility per cent, 1000-grain weight, grain yield plant<sup>-1</sup>, Standard Evaluation Score for visual salt injury symptoms and Na<sup>+</sup>/K<sup>+</sup> ratio in the shoot. The results indicated that these characters are more amenable for selection as they appeared to be predominantly controlled by additive gene effects and are found to be least influenced by environment and more emphasis may be given to these traits while executing selections under saline conditions.

**Key words :** Genetic parameters, Physiological traits, Yield.

## **Inheritance of Sugar Yield and Character Association Study in Sweet Sorghum [*Sorghum bicolor* (L.) Moench]**

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### **ABSTRACT**

Inheritance and character association study of sugar content in sweet sorghum was carried out during 2010 - 12 at Directorate of Sorghum Research, Hyderabad. Two newfangled crosses of sweet sorghum were generated during *kharif*, 2010 by crossing parents which are contrasting for the trait of interest *i.e.*, low sugar content (27 B and ICSB 38) with high sugar content (SSV 84 and SSV 74). F<sub>1</sub> generation was raised during *rabi*, 2010 - 11 and F<sub>2</sub>, B<sub>1</sub> and B<sub>2</sub> crosses were attempted. On the basis of sugar yield, plants were grouped into two distinct classes *i.e.*, high sugar and low sugar content. Chi square test was applied to test the goodness of fit for the segregation ratio and it was evident that sugar content in both the crosses governed by simple monogenic pattern (3High sugar: 1low sugar) of inheritance for this trait with high sugar content being governed by dominant and low sugar by recessive allele. Further, correlation studies in F<sub>2</sub> generation revealed significant positive correlation of sugar yield with juice yield, fresh stalk yield, total biomass, grain yield, total soluble sugars, brix per cent and bioethanol yield. These correlated traits can be effectively utilized in formulating indirect selection schemes.

**Key words** : Inheritance, chi square test, monogenic, dominant, recessive, correlation.

## **Study of Correlation and Path Analyses over Environments in Sesamum (*Sesamum indicum* L.)**

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### **ABSTRACT**

Ten Sesame genotypes were evaluated during *kharif*, 2010 and *rabi*, 2010-11 over 6 environments in respect of 9 quantitative characters. Analysis of variance revealed significant differences among genotypes for all the nine characters studied. Number of capsules per plant and 1000 seed weight were positively associated with seed yield per plant in all the six environments while number of seeds per capsule was positively associated with seed yield per plant in all the environments except environment VI. The character plant height exhibited significant positive association with seed yield per plant in all environments except II and III. Path coefficient analysis showed direct positive contribution of plant height, days to 50% flowering, number of capsules per plant, number of seeds per capsule, 1000 seed weight and oil content on seed yield. These traits deserve special emphasis in selection while improvement of seed yield in sesamum.

**Key words** :Correlation, Path Analysis, Sesamum.

## **Studies on the Effectiveness of Production of Transgenic Plants of Tomato cv.PKM-1 through *Agrobacterium* Mediated Genetic Transformation**

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### **ABSTRACT**

Tomato cv.PKM-1 cotyledon explants from 10 days old tomato seedlings were optimized to obtain adventitious shoot buds with high frequency were utilized for *Agrobacterium* mediated transformation. Efficient transformation of these cotyledons was achieved using the *Agrobacterium* strain LBA4404 containing the binary vector pCAMBIA 2301 harboring *npt II* as selectable marker and GUS as reporter gene. Confirmation of the transgene integration in the putative transformants was done by using the histochemical GUS staining and PCR. The transformation frequency was 3.5% and the GUS gene transient expression level in transformants was 44.4%. Thus, the present study successfully demonstrated the indirect regeneration of transgenic plants from cotyledonary explants through *Agrobacterium* mediated genetic transformation approach in tomato cv. PKM-1. The standardized protocols of present study may be utilized for further transgenics development in PKM-1 cultivar genetic background.

**Key words :** *Agrobacterium*, *In-vitro* cultures, Tomato, Transformation.

## **Heterosis and Combining Ability Studies for Grain Yield and its Component traits in Maize (*Zea Mays* L.)**

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### **ABSTRACT**

Combining ability and heterosis for grain yield and its component traits were studied in maize through line x tester mating design using sixty three lines and two testers along with check DHM 117. The studies on combining ability in maize provide information to identity potential parents of hybrids and single cross hybrids. The results revealed that the existence of non-additive gene action for all the characters studied. The lines RSK-5, RSK-6, RSK-16 and RSK-47 and the tester BML-7 had recorded significant *gca* for yield and most of the yield component traits studied. The hybrid, RSK-105 x BML-6 recorded significant values for earliness while considering days to 50 percent tasselling and days to 50 percent silking. Three superior hybrids *viz.*, RSK 5 x BML-7, RSK-109 x BML-6 and RSK-19 x BML-7 were identified for higher grain yield based on *per se* performance, *sca* effects and standard heterosis and will be proposed for multilocation testing across locations under AICRP.

**Key words :** Combining ability, Heterosis, Linex tester analysis, Maize.

## **Genetic Diversity For Grain Yield And Physiological Parameters Under Mild Water Stress Condition in Maize (*Zea mays* L.)**

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### **ABSTRACT**

The extent of genetic divergence between genotypes in the present experimental material was observed by Mahalanobis  $D^2$  analysis. In the present investigation based on  $D^2$  analysis, 49 genotypes were grouped into 8 clusters. The magnitude of  $D^2$  values suggested that there was considerable amount of diversity in the experimental material used in investigation. Maximum divergence was found between cluster III and VIII, suggesting that the genotypes in these clusters could be fully exploited to explore the wide range of heterosis and to release good recombinant lines by intermating them in a definite design.

**Key words :** Maize  $D^2$  analysis Cluster analysis Mild Water stress condition.

## **Cause and Effect Relationship between Yield, Quality and Yield Attributing Traits in Rice (*Oryza sativa*. L.)**

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### **ABSTRACT**

Correlation studies revealed positive and significant association of total biomass, harvest index, number of productive tillers per plant, plant height, panicle length, days to 50% flowering and number of filled grains per panicle with grain yield per plant. Selection based on total biomass, harvest index, productive tillers per plant and 1000 grain weight would be more useful for improvement of grain yield in rice, because of their high and positive direct effect on grain yield.

**Key words :** Correlation, *Oryza sativa* L., Path analysis, Rice.

## **Genetic Variability, Heritability and Genetic Advance in Pigeonpea (*Cajanus cajan* (L.) Millsp.)**

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### **ABSTRACT**

Eighty three genotypes were studied to know their performance, genetic variability {genotypic coefficient of variation (GCV)} and phenotypic coefficient of variation (PCV)}, heritability (broad sense) { $h^2$  (b)} and genetic advance as percent of Mean (GA as % of Mean) for yield and its contributing characters. Significant variation among the genotypes for all the 11 characters studied was observed. Wide ranges were observed for all characters days to 50% flowering, days to maturity, plant height, number of branches per plant, number of pods per plant, pod length, seed yield per plant, 100 seed weight and harvest index and protein content but for number of seeds per pod. GCV for all the characters was lesser than PCV evidencing masking effects of the environment. High PCV coupled with high GCV was observed for number of branches per plant, number of pods per plant, seed yield per plant and harvest index, indicating the presence of wider variability for these traits in the population studied. High genetic variability coupled with high  $h^2$  (b) and high GA as % of mean was observed for days to 50% flowering, days to maturity, number of branches per plant, number of pods per plant, seed yield per plant and harvest index exhibiting the role of additive gene action governing the inheritance of these traits.

**Key words :** Coefficients of Variation, Genetic Advance, Heritability, Pigeonpea, Variability.

## **Morphological Characterization of Pigeonpea (*Cajanus cajan* (L.) Millsp.) Genotypes**

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### **ABSTRACT**

Forty nine genotypes of pigeonpea [*Cajanus cajan* (L.) Millsp.]. were characterized during kharif, 2010-11 at Regional Agricultural Research Station, Lam, Guntur for 15 morphological characters viz., anthocyanin colouration of hypocotyls, plant branching pattern, plant growth habit, stem colour, leaf shape, pubescence on lower surface of the leaf, flower colour, pattern of streaks on petal, pod colour, pod surface stickiness, pod waxiness, pod constriction, seed colour, seed colour pattern and seed shape as per Distinctiveness (D), Uniformity (U) and Stability (S) test guidelines of pigeonpea. Variability was observed for all morphological characters studied but for growth habit and stem pigmentation i.e. all genotypes are indeterminate and with green stem. Absence of anthocyanin on hypocotyls (79.59%); erect branches (53.06%); oblong leaves (77.53%); no pubescence (91.84%); yellow flowers(75.51%); sparse streaks on petals (44.59%); waxiness (55.1%); greenish brown pods (49%); non sticky pods (57.14%); slight constriction on pods (63.27%); uniform seeds (77.55%); dark brown colour of seeds (42.86%); and oval seeds (61.22%) are more common. These results help in protection of genotypes besides aiding for further utilization, without repetition or waste of time, to develop high yielding stress tolerant varieties and/or hybrids.

**Key words :** Characterization, DUS testing, Germplasm, Pigeonpea.

# **Correlation and Path Coefficient Analyses in Pigeonpea (*Cajanus cajan* (L.) Millsp.) for Seed Yield and Yield Contributing Characters**

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## **ABSTRACT**

An investigation on genetic divergence in pigeonpea [*Cajanus cajan* (L.) Millsp.] was carried out during *kharif* 2010-11 at Regional Agricultural Research Station, Lam, Guntur with 41 genotypes to elicit the information on character association and path analysis. Observations were recorded on thirteen characters *viz.*, plant height (cm), days to 50% flowering, days to maturity, number of primary branches per plant, number of secondary branches per plant, number of pods per plant, pod length (cm), number of seeds per pod, shelling percentage, 100 seed weight (g), seed yield per plant (g), grain protein content (%) and harvest index. The correlation study indicated that the plant height, number of secondary branches per plant, number of pods per plant, number of seeds per pod and harvest index had significant positive association with seed yield and simultaneous improvement of these characters along with seed yield is possible. Path coefficient analysis revealed that harvest index, plant height, number of primary branches per plant and 100 seed weight had positive direct effects on seed yield per plant and due weightage should be given for them for yield enhancement.

**Key words :** Correlation, Path Coefficient Analysis, Pigeonpea.

## **Molecular Characterization of Drought Tolerant Lines in Rice using Microsatellite Markers**

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## **ABSTRACT**

Drought is one of the major abiotic stresses in rainfed rice which causes low yields (0.7 to 1.5 t/ha). Drought being the most devastating environmental stress, continuous efforts are needed to improve the crop productivity under water-limiting conditions. Molecular characterization of the genotypes and study on extent of variability among the genotypes for complex traits like drought is essential to incorporate such genotypes in the breeding programme. The experimental material consisted of 44 advanced breeding lines developed at APRRI & RARS, Maruteru in the APNL Biotechnology project. These 44 advanced breeding lines were characterized using a set of 30 microsatellites or SSRs (simple sequence repeat) spanning all the 12 rice chromosomes. The total number of alleles detected in the study was 46 and out of these 46 alleles, 29 alleles (63%) were polymorphic. The number of alleles detected at a single locus ranged from 1-3 with an average of 1.5 alleles per locus. UPGMA analysis has grouped the 44 genotypes into nine clusters. Clusters I to V had single genotype each, while cluster VII had two genotypes. Cluster VIII and Cluster VI had three and four lines respectively. Of all the clusters, Cluster IX is the largest having 30 genotypes. The coefficient of similarities based on random data among genotypes ranged from 0.46 to 0.59 with an average similarity index of 0.53.

**Key words :** Characterization, Drought, Markers, Microsatellite, Rice.



# **Character Association Studies in First Clonal Generation of Sugarcane (*Saccharum* spp.)**

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## **ABSTRACT**

The correlation studies in first clonal stage involving 429 genotypes and four checks revealed that NMC at harvest, number of green leaves at 90, 120, 240 DAP and at maturity, biomass per cane, internode number, internode length, stalk length, stalk diameter, stalk volume, single cane weight, HR brix and HR brix yield showed positive and significant association with cane yield and also among themselves indicating that simultaneous selection for these characters would result in the improvement of cane yield in sugarcane. Path analysis revealed that HR brix yield, single cane weight and number of millable canes exhibited high positive direct effects on cane yield indicating that these were the major contributing characters to cane yield in sugarcane.

**Key words :** Correlations, Path analysis, Sugarcane.

# **Molecular Diversity Analysis of Peanut Mini Core Collection using RAPD Markers**

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## **ABSTRACT**

Twenty nine accessions of groundnut minicore collection belonging to different botanical types along with five cultivars viz., GPBD-4, M 28-2, TAG 24, JL 24 and MN 1-35 were selected for RAPD assay to assess the molecular diversity through twenty primers. Out of the twenty primers used, the primers namely OPK 14, OPA 19, OPC 15, OPC 09, OPC 13, OPB 11, OPF 09, OPJ 06, OPV 16, OPA 15, OPA 20, OPA 12 and OPF 10 have shown high polymorphism across all four botanical types. The polymorphism per primer ranged from 57.14% to 100%. The dendrogram revealed six distinct clusters but the accession in each cluster could not associate with subspecies or botanical types, even cluster did not show any association with geographical origin. This indicated independence of molecular diversity with morphological diversity. The similarity coefficient ranged from 0.63 to 0.93 indicating substantial diversity present in the mini core collection. Accessions with the most distinct DNA profiles are likely to contain greater number of novel alleles as revealed by RAPD assay. Substantial genetic diversity exists in the mini core that could be exploited in crop improvement programme.

**Key words :** Dendrogram, Groundnut, Mini Core collection, RAPD polymorphism, Similarity Coefficient.

# Characterization, Classification and Nutritional Status of Sugarcane Growing Soils of Chittoor District of Andhra Pradesh

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## ABSTRACT

Based on variation in soils and physiography, six typical pedons namely Neruvoi (P1), Palamangalam (P2), Gollapalle (P3), Vonaruvaripalli (P4), Digavapokalavaripalli (P5) and Gattivaripalli (P6) in Chittoor district, Andhra Pradesh were characterized for their physical and chemical properties and for nutritional status of sugarcane-growing soils. These pedons were shallow (P3 and P4), deep (P2, P5 and P6) and very deep (P1) and had Munsell colour notation of 10 YR / 7.5YR hue, with value 2 to 6 and chroma 1 to 6. The dominant soil structure is fine to medium, weak to moderate and sub-angular blocky. Sand, silt and clay ranged from 32.70 to 94.04, 3.97 to 39.60 and 1.99 to 35.86 per cent, respectively in different horizons and bulk density varied from 1.29 (P4) to 1.94 Mg m<sup>-3</sup> (P1). These soils are neutral to strongly alkaline in reaction (7.35 to 8.21). The CEC of the soils varied from 1.30 to 28.80 cmol(p<sup>+</sup>)kg<sup>-1</sup> in different horizons. Calcium and magnesium were found to be the dominant cations on the exchange complex. Organic carbon was low to medium. The soils were low in available N, low to high in available P and K and sufficient in available sulphur. The DTPA-extractable zinc in sugarcane-growing soils was sufficient in surface horizons and deficient in sub-surface horizons in all the pedons except in P4 (Vonaruvaripalli) and P6 (Gattivaripalli) wherein it was found to be deficient in P4 and sufficient in P6. The sugarcane-growing soils were deficient in DTPA-extractable iron and sufficient in DTPA-extractable copper and manganese. Pedon 1 showed argillic (Bt) sub-surface horizon and was classified as Ultic Haplustalf. Pedons 2, 5 and 6 showed cambic (Bw) sub-surface diagnostic horizon and were classified as Typic Dystrustept and Typic Haplustept. Pedons 3 and 4 did not exhibit any diagnostic horizon and were classified as Typic Ustorthent.

**Key words :** Characterisation, Classification, Sugarcane-growing soils, Nutrient status.

## Effect of Organic Manures, Inorganic Fertilizers and their Integration on Yield and Nutrient Uptake by Maize-Spinach Cropping System

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## ABSTRACT

A field experiment was conducted on a red sandy loam soil (*Alfisol*) during *rabi* (maize) and summer (spinach) seasons of 2009-2010 with a view to study the effect of organic manures, inorganic fertilizers and their integration on soil nutrient uptake and yield of maize-spinach cropping system. Among different combinations application of 75% RDF + 25% through vermicompost recorded significantly highest grain and stover yields (52.38, 60.77 q ha<sup>-1</sup>) at harvest but was on par with 75% RDF + 25% through poultry manure and 75% RDF + 25% through FYM. The spinach crop grown during summer responded favourably to the residual and cumulative treatments and the highest fresh leaf yield (14.68 and 12.37 t ha<sup>-1</sup>) was recorded in cumulative and residual treatments. Application of 75% RDF + 25% through VC, PM and FYM to the maize crop showed the highest uptake of N, P and K at vegetative, tasseling and at harvesting stages. The highest leaf yield and nutrient uptake of N, P and K by spinach at harvest was recorded in residual and cumulative treatments receiving 100% organic manures.

**Key words :** Cropping system, Fertilizers, Nitrogen, Maize, Organic manures, Spinach, Uptake.

# **Influence of Integrated Nutrient Management on Microbial Biomass and Enzymes under Long term Rice-rice Cropping System in Alfisols**

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## **ABSTRACT**

Soil microbial biomass dynamics and the activity of soil enzymes were studied in different integrated nutrient management treatments in rice-rice cropping system in Alfisols of southern Telangana zone of Andhra Pradesh during 2005-06 and 06-07. The substitution of 25 or 50% N fertilizer with *Glyricidia* significantly enhanced the CO<sub>2</sub> evolution indicating, higher respiration rate than the fertilized soil in the upper 0 to 15 cm depth. The effect of different integrated nutrient management treatments did not increase the microbial biomass significantly over the complete reliance on fertilizing the crop with optimum nutrient requirement. The biochemical assay indicated higher enzymatic activity in the upper 0 to 15 than 15 to 30 cm depth of the soil. The influence of FYM, paddy straws, as well as *Glyricidia* was superior on enzymatic activity when combined with fertilizers.

**Key words :** Alfisols, Integrated Nutrient Management, Soil microbial biomass, Soil enzymes.

# **Effect of Levels of Irrigation and Fertigation on Growth, Yield and Quality Parameters in Tomato (*Lycopersicon esculentum L.*)**

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## **ABSTRACT**

An experiment was conducted during *rabi* seasons of 2007 and 2008 to study the effect of two levels of irrigation and six fertigation levels on the dry matter production, 100 fruit weight, fruit yield, quality parameters and monetary returns in respect of tomato crop at Water Technology Center, College of Agriculture, Rajendranagar, Hyderabad. Results indicated that maximum total dry matter production (5.96 t ha<sup>-1</sup>) was obtained with the application of 100 per cent RD of N with 100 per cent RD of K and tended to decrease with the decrease in application levels of recommended dose of nitrogen (50-75%) and potassium (75%). Application of 75 per cent RD of N along with 100 per cent RD of K recorded significantly higher 100 fruit weight (8.7 kg) and fruit yield (35.32 t ha<sup>-1</sup>) as compared to all other treatments. No significant difference in fruit yield was noticed between the two irrigation levels *i.e.* 1.0 E pan (31.08 t ha<sup>-1</sup>) and 0.8 E pan (32.18 t ha<sup>-1</sup>). Quality parameters *viz.*, ascorbic acid, reducing sugars, non-reducing sugars, total soluble solids, lycopene, acidity and pulp ratio were not influenced significantly due to levels of irrigation and fertigation. Scheduling of irrigation at 0.8 E pan recorded higher net returns (Rs. 79,861 ha<sup>-1</sup>) and B C Ratio (2.44) as compared to returns of Rs 76,028 and B.C ratio of 2.32 recorded under 1.0 E pan. Among the fertigation levels, application of 75 per cent of RD of N and 100 per cent of RD of K registered maximum net returns (Rs. 90,755 ha<sup>-1</sup>) and B C Ratio of 2.76 and the lowest returns of Rs 64,672 ha<sup>-1</sup> and B C ratio 1.95 was recorded with application of 50 per cent of RD of N and 75 per cent RD of K. Significant positive correlation was observed between yield and various parameters.

**Key words :** Irrigation levels, Fertigation, Tomato, Quality parameters, Yield .

## **Effect of Selected Agrochemicals on Radial Growth of *Trichoderma harzianum* (Th<sub>4</sub>) in Vitro**

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### **ABSTRACT**

Commonly used agrochemicals at recommended field concentrations were evaluated for their toxicity to *Trichoderma harzianum* (Th<sub>4</sub>) obtained from cotton ecosystem. Among fungicides, carbendazim showed higher toxicity followed by captan, metalaxyl, mancozeb and copper oxychloride. Chlorpyrifos was found more toxic followed by quizalofop ethyl among insecticides. Zinc sulphate followed by urea and diammonium phosphate was found to be the most toxic fertilizer. Imidacloprid, imazethapyr, single super phosphate, magnesium sulphate, muriate of potash and gypsum showed lesser inhibition on poisoned food and hence are likely to be compatible with *T. harzianum* (Th<sub>4</sub>).

**Key words :** Insecticides, Fertilizers, Fungicides, Herbicides, *Trichoderma*, Toxicity.

## **Prevalence of *Pseudomonas fluorescens* in Different Cropping Systems and Soil Types**

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### **ABSTRACT**

Twenty eight isolates of *Pseudomonas fluorescens* were isolated from rhizosphere of eleven cropping systems in Guntur district. All the isolates produced pigment on King's B medium and showed fluorescence under UV light. Highest number of isolates was obtained from cotton and turmeric rhizospheres. Population and frequency of obtaining *P. fluorescens* was much higher in black soils than in sandy soils. Frequency of *P. fluorescens* isolates was highest at pH 8.0 followed by pH 7.5 and the least number of isolates was obtained at pH 7.0. All the isolates showed antagonistic activity against *Sclerotium rolfsii* in dual culture with four of them showing >75% inhibition besides inhibiting sclerotial production. Cell free culture filtrates of the four *P. fluorescens* isolates also inhibited growth and the sclerotial germination of *S. rolfsii* at concentrations higher than 40%.

**Key words :** Cropping systems, Dual culture, Population dynamics, *Pseudomonas fluorescens*, *Sclerotium rolfsii*, Soil types.

## **Seasonal Occurrence of Spotted pod borer, *Maruca vitrata* (Geyer) (Pyralidae: Lepidoptera) on Greengram in Rabi**

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### **ABSTRACT**

Field experiment was conducted to study the seasonal occurrence of spotted pod borer, *Maruca vitrata* (Geyer) (Pyralidae: Lepidoptera) on greengram at Agricultural Research Station, Madhira, Khammam district during *Rabi*, 2009-10 and 2010-11. The results revealed that, the initial incidence of *M. vitrata* was observed during the last week of November to 1<sup>st</sup> week of December *i.e.* at the bud initiation stage of the crop. Peak bud infestation (50.0%) was noticed in 48<sup>th</sup> standard week. The population and infestation gradually declined and reached minimum and the pest has disappeared by the third week of January. The results showed that all the weather variables together contributed to the per cent variation in larval population, bud infestation, flower infestation, webbing and pod damage by 70.52, 73.79, 38.52, 40.50 and 89.60 per cent respectively. Of the five variables in question, maximum temperature has been found to exert significant negative influence whereas, minimum temperature exert significant positive influence on larval population and bud infestation. But it is reverse in case of flower infestation and webbing. All the weather variables have been found to exert significant influence on pod damage in *rabi* season.

**Key words :** Greengram, *Maruca vitrata*, Seasonal occurrence, *Rabi*.

## **Promotion of Direct Sowing Paddy using 8-row Drum Seeder in Vizianagaram District**

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### **ABSTRACT**

The DAATTCentre, Vizianagaram has introduced an 8-row drum seeder in farmers field of Sri GAV Rama Raju, Thettangi village, Gurla mandal, Vizianagaram district during Kharif, 2007 to evaluate the efficiency of drum seeder and was compared with conventional methods of transplanted and broadcasted rice. After the success of the trial, the DAATTCentre promoted direct sowing of paddy using drum seeder during kharif and rabi seasons of 2007,2008 and 2009 through 34 on- farm trials, 36 front line demonstrations, 18 exposure visits for farmers, 6 field days, 18 farmers training programmes and one rythusadassu in collaboration with department of agriculture and NGO (world vision) in all the mandals of Vizianagaram district. Seeding of sprouted seed @ 30 kg/ha with drum seeder was at par with transplanting and broadcasting methods and recorded increased grain yield by 44.4% and 31.2% over the farmers practice of transplanting and broadcasting. Direct sowing paddy using 8-row drum seeder reduce the seed rate by 46-73% as compared to transplanting/ broadcasting. The cost of rice cultivation using drum seeder is reduced by 23% as compared to conventional transplanted rice and 28% as compared with broadcasted rice. Adoption of direct sowing paddy in puddled field using 8-row drum seeder gives 40 to 55% more net profit than transplanted rice. During 2007-08 to 2009-2010, an estimated 7,500 farmers in Vizianagaram district adopted direct sowing paddy using drum seeder on around 2800 hectares.

**Key words :** Direct seeding paddy, Front line demonstrations and field days, 8-row drum seeder, Net returns, Yield.

# **Efficacy of New Fungicides and Essential Oils Against Powdery Mildew and *Corynespora* Leaf Spot of Blackgram**

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## **ABSTRACT**

A field experiment was conducted to evaluate the efficacy of new fungicide molecules and two essential oils against powdery mildew and *Corynespora* leaf spot in blackgram for two consecutive seasons i.e. during Rabi 2009-10 and 2010-11 at Regional Agricultural Research Station, Lam, Guntur, Andhra Pradesh. The results showed difenconazole @ 0.5 ml/lit or carbendazim @ 1.0 g/lit were highly effective against powdery mildew in blackgram, while hexaconazole @ 2.0 ml/lit, propiconazole @ 1.0 ml/lit and mancozeb @ 2.5 g/lit found highly effective against *Corynespora* leaf spot in blackgram. But essential oils such as winter green oil and Eucalyptus oil were failed in suppressing both the diseases in blackgram. The seed yield was highest from the plots treated with hexaconazole @ 2.0 ml/lit during both the years of experimentation.

**Key words :** *Corynespora* leaf spot, Essential oils, New fungicide molecules, Powdery mildew, Urdbean.

# **Leaf Gas Exchange Characters of *Musa* AB ‘Ney Poovan’ and *Musa* ABB (Pisang awak) Karpuravalli**

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## **ABSTRACT**

Ney Poovan (AB) and Karpuravalli (ABB) are indigenous and popular banana cultivars in south India for its unique taste, sweetness and flavour. Leaf gas exchange traits for these cultivars are important for better management practices. Diploid cv. Ney Poovan recorded higher photosynthesis ( $12.49 \mu\text{mol m}^{-2} \text{s}^{-1}$ ) than triploid cv. Karpuravalli ( $9.57 \mu\text{mol m}^{-2} \text{s}^{-1}$ ) during vegetative stage. Ney Poovan has erect and narrow leaves compared to Karpuravalli (broad and droopy leaves) and helps in intercepting radiation effectively during morning hours. Stomatal conductance ( $g_s$ ) could demarcate physiologically efficient leaves in both the cultivars, as older and youngest leaves recorded lower stomatal conductance. The older leaves transpired on par with most active leaves with lower assimilation rate in both cultivars. The gas exchange parameters recorded higher in top 2-5 leaves, therefore these leaves can be used for any physiological and biochemical studies they reflect active physiological state of the leaves. Ney Poovan manifested early vigor by increased  $P_n$ ,  $g_s$  than Karpuravalli. Therefore, nutrient scheduling and management practice must be worked out separately for each cultivar; thereby we can exploit production potential of both cultivars.

**Key words :** Banana cultivars, Karpuravalli, Ney Poovan, Photosynthesis, Stomatal conductance, Transpiration.

## **Effect of Different Growth Regulating Compounds on Biochemical and Quality Parameters in Greengram**

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### **ABSTRACT**

A field experiment was conducted to study the Effect of different growth regulating compounds on biochemical and quality parameters in greengram during *rabi* 2009-10. Among the growth regulators, growth promoting substance NAA (20 ppm) recorded significantly higher values for biochemical parameters, photosynthetic rate where as relative chlorophyll content (SCMR) values were highest in chlormequat chloride 50% SL 375.0 g a.i ha<sup>-1</sup>, mepiquat chloride 5% AS (5%) and NAA (20ppm) during reproductive stage. Among the quality parameters highest seed protein content (%) and highest nitrogen harvest index values were recorded with growth retarding substance chlormequat chloride (187.5 g a.i ha<sup>-1</sup>) in greengram.

**Key words :** Biochemical parameters, Greengram, Plant growth regulators, Quality parameters.

## **Variability, Heritability and Genetic Advance in Vegetable Cowpea (*Vigna Unguiculata* (L.) Walp)**

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### **ABSTRACT**

Different parameters were estimated to assess the magnitude of genetic variability in 22 diverse genotypes of vegetable cowpea (*Vigna unguiculata* subsp. *unguiculata*). The analysis of variance indicated the prevalence of sufficient genetic variation among the genotypes from all the characters studied. The high phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV) were observed for pod weight, plant height, and pod length. High heritability coupled with high genetic advance were observed for all characters studied, except days to first flowering and days to first harvest indicating that these characters are governed by additive gene action. Hence, direct selection may be followed for the improvement of vegetable cowpea for these characters.

**Key words :** Genetic advance, Heritability, Variability, Vegetable cowpea.

# **Performance Evaluation of Power weeder, Star weeder and Wheel hoe**

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## **ABSTRACT**

Performance evaluation of intercultural implements such as power weeder, star weeder and wheel hoe was conducted in the Agricultural college farm, Bapatla during the year 2012-13. Three weeders were initially evaluated in the dry land planted with maize with a plot size 20 m × 10 m. Power weeder was also evaluated in the wet land (paddy field) at the plant age of 30 days which was maintained with a crop row to row spacing of 20 cm and average plant to plant spacing of 18cm. Actual field capacity, theoretical field capacity, field efficiency, weeding efficiency, plant damage and cost of operation were considered to evaluate the performance of three weeders.

Actual field capacities and theoretical field capacities of power weeder, wheel hoe and star weeder were 0.0494 ha/h, 0.022 ha/h, 0.021 ha/h and 0.060 ha/h, 0.030 ha/h, 0.026 ha/h respectively. Whereas field efficiencies of power weeder, wheel hoe and star weeder was found to be 82.33%, 73.66%, 80.76% respectively. Power weeder has more field efficiency than other two weeders. Plant damage observed for power weeder, wheel hoe and star weeder were 11.10%, 2.20%, and 1.17% respectively. Weeding efficiencies of power weeder, wheel hoe and star weeder were found as 78.4%, 74.0%, and 75.4% respectively. Power weeder has more weeding efficiency than other two weeders. Cost of operation of power weeder, wheel hoe and star weeder was Rs.2532.71/ha, Rs.1696.5/ha and Rs.1785.37/ha respectively. Operational cost is more for power weeder and less for wheel hoe, star weeder compared to power weeder. Actual field capacity, theoretical field capacity, field efficiency, weeding efficiency of power weeder in wet land were 0.0439 ha/h, 0.072 ha/h, 60.9 %, 69.65% respectively. Plant damage observed in paddy field weeding was 8.34%. Cost operation of power weeder in wet land (paddy) field is Rs.2658.20 /ha. The weeding efficiency and cost of operation were more for power weeder under wet land weeding.

**Key words :** Field capacity, Plant damage, Power weeder, Star weeder, wheel hoe.

## **Factors Determining Member's Participation in Microfinance Programme in Andhra Pradesh**

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## **ABSTRACT**

The factors determining member's participation in microfinance programme in Andhra Pradesh have been identified following the multi-stage purposive and random sampling technique. Probit analysis was employed to know the factors determining the member's participation in both SHG and JLG programmes and participation in only SHG programme. The analysis of determinants of member's participation in microfinance programme revealed that social backwardness of the household, households with farming as main occupation and higher family expenditure had significant positive influence on participation in both SHG and JLG programmes and only SHG programme. The age of the respondents had significant negative influence on participation in only SHG programme.

**Key words :** Joint liability groups, Microfinance, Probit model, Self-help groups.



# **Assessment of On-farm Employment Generation through Natural Resource Conservation Activities in the Semi-arid Region**

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## **ABSTRACT**

A watershed development programme in the backward and disadvantaged district of Karnataka (Chitradurga) was implemented in a participatory mode with 'demand driven' planning. Various kinds of soil and moisture conservation activities were carried out to treat the non-arable as well as arable lands with measures like construction of field bunds and waste weirs; treatment of drainage lines (DLT) through construction of rock fill dams, *nala* deepening; planting of forest tree and fruit seedlings, etc. A bulk of the budget (58%) was utilized for various land based activities covering engineering works, plantation and production enhancement activities including livestock improvement. Different engineering works alone created nearly 3623 mandays temporary employment, while plantation activities generated about 2375 man days. At the then prevailing wage rates for unskilled labour, nearly `8.78 lakhs worth of employment was generated. The cumulative effect of resource conservation activities on crop cultivation would definitely enhance regular labour absorption at the farm level. The above information clearly indicates that participatory planning and implementation can lead to the generation of significant employment opportunities in various natural resources conservation activities in the dry region.

**Key words** : *Bunds*, Employment generation, Horticulture, Natural resource conservation, Watershed.

# **Impact of Credit and Technology on Net Farm Returns of Farmers in Kadapa District of Andhra Pradesh**

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## **ABSTRACT**

The results of the study brought that credit and technology played an important role in increasing net farm income. The credit was more effective under recommended technology than under existing technology on both the size groups. There is a greater potentiality of increasing net farm returns through borrowing adequate capital on small farms under recommended technology as compared to large farms.

**Key words** : Credit and technology, Net farm returns.

# **A Study on Knowledge Level of Farmers about BT Cotton Cultivation Technologies in Andhra Pradesh**

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## **ABSTRACT**

The study was conducted with 180 cotton farmers to assess the knowledge level on Bt cotton production technologies. The study revealed that majority (60.56%) of Bt cotton farmers had medium knowledge followed by high (20.00%) and low (19.44%) knowledge levels respectively on Bt cotton cultivation technologies. The study also indicated that the knowledge of farmers towards Bt cotton cultivation technologies was more or less same among large, medium and small farmers. Majority of the respondents were found to have knowledge on purpose of development of Bt cotton (92.22%), names of Bt cotton hybrids (86.67%), critical crop growth stages for irrigation (83.33%), days of protection of Bt technology against boll worms(83.33%).

**Key words :** Analysis of variance, Bt cotton, Content analysis

# **Use of Wi-fi Internet by the Students of Tamil Nadu Agricultural University, Coimbatore**

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## **ABSTRACT**

An exploratory research was conducted involving 147 students to know the use of wi-fi internet by the students of Tamil Nadu Agricultural University (TNAU). The purpose of using internet, perception on present status of wi-fi, perceived problems and suggestions for improving wi-fi connection in the University were studied. For academic purpose 22.45 per cent students used daily for preparing assignments, followed by weekly (40.82%), monthly (27.89%) and rarely (8.84%). For entertainment purpose 28.57 per cent students used daily for watching video songs or movies, followed by weekly (31.29%), monthly (6.12%), rarely (21.08%) and 12.94 per cent never used. To download reading materials 17.68 per cent students used daily, followed by weekly (34.69%), monthly (29.25%), rarely (13.60%) and 4.78 per cent never used. Social networks like facebook was used daily (40.13%), followed by weekly (23.12%), monthly (6.12%), rarely (10.88%) and never (19.75%). Students used wi-fi to purchase books monthly (3.40%), rarely (65.99%) and never (30.61%). A very meager proportion of the respondents felt that the status of the wi-fi connectivity is good (3.40%), followed by average (42.86%) and poor (53.74%). Nearly two third of the students perceived the problem of slow connection (65.98%), followed by power failure (21.08%) and lack of proper maintenance (5.46%). A little more than two fifth of the respondents suggested the increase of band width/speed (41.50%), followed by increase access points (20.40%) and regular monitoring of the connection (8.16%).

**Key words :** wi-fi internet

# **Magnitude of adoption of IPM practices in Redgram by farmers of Prakasam district**

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## **ABSTRACT**

The study conducted in Prakasam district of Andhra Pradesh to know the Magnitude of adoption of Integrated Pest Management practices (IPM) in redgram crop. IPM applies different practices like pest resistant plants, use of entomopathogens such as bacteria, viruses and strategies that involves cultural, physical, mechanical, biological and chemical control. The use of these combined lactics reduces the chances of generating resistance and insect survival. The main aim of IPM is to protect crops with minimum cost and reduce the risk for humans, animals and ecosystems. In Prakasam District, 3 mandals were selected for the study based on the accessibility and area of redgram cultivation. From each selected mandal two villages were selected for the study one IPM village and the other non-IPM village. In IPM villages farmers were trained scientifically by Krishi Vigyan Kendra (KVK), Darsi, Prakasam district. In these villages farmers were exposed to advanced and scientific techniques by method demonstrations, Front line demonstrations, on farm trials, training programmes, vocational training programmes, group discussions etc. But in non IPM villages they were not trained scientifically. In this study the schedule consisted of 20 practices. The positive statements were scored with 1 and the negative with 0. For each practice in both IPM and non IPM villages frequencies and percentages were measured to see the extent of adoption by the farmers. Based on the number of IPM practices adopted, farmers were grouped into 3 categories with low adoption, medium adoption and high adoption to assess the difference in adoption between IPM and non IPM villages, whether it is significant or non-significant. Primary data was obtained directly from the farmers and fields. The observations in the present study denote that adoption of IPM practices were more in IPM villages. There were significant differences between the farmers of IPM and non IPM villages in the adoption of IPM practices.

**Key words :** Adomption, IPM, Redgram.

# **Usage of Teaching Aids, Teaching Methods, Learning Resources, Physical Facilities and Teaching Styles of the Teachers of Agricultural College, Bapatla**

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## **ABSTRACT**

Agricultural College, Bapatla was purposively selected out of the six Agricultural College in ANGRAU to know the usage of Teaching Aids, Teaching Methods, Learning Resources, Physical Facilities and Teaching Styles of the Teachers of Agricultural College, Bapatla. The study was conducted by adopting the Ex - Post - Facto Research Design. The respondents for the study include all teachers (56) on rolls as on the date of study in the selected campus. Effort is made to know the distribution of respondent teachers over their usage of Teaching Aids, Teaching Methods, Learning Resources, Physical Facilities and Teaching Styles of the of Agricultural College, Bapatla

**Key words :** Learning resources, Physical facilities, Teaching aids, Teaching methods.

## **Indigenous Knowledge of Agricultural Practices and Communication Pattern of Tribal Farmers in Sidhi District of Madhya Pradesh**

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### **ABSTRACT**

The study was conducted in six villages of Kusmi and Majhauili Block of Sidhi district of Madhya Pradesh. The primary objective of this paper is to identify the indigenous knowledge used in agriculture practices by tribal farmers in that area. Indigenous knowledge is the knowledge that has been developed over time in a community mainly through accumulation of experiences and intimate understanding of the environment in a given culture. This research covers indigenous knowledge on farming tasks such as managing soil fertility, controlling pests and diseases, harvesting, storage of grains, weather prediction, detection of underground water and mixed cropping pattern. From the results we can conclude that indigenous knowledge should be recorded and used to devise innovative research for agricultural researchers, extension workers and development practitioners for improvement in agriculture. In relation to communication pattern of tribal farmers most of the farmers are preferred Bhaui bazaar (91.11%), for source of information followed by Baithaki/Mukhiya (86.66%).

**Key words :** Indigenous knowledge, Pest management, Weather prediction.

## **Training Needs of Paddy Farmers in Guntur District of Andhra Pradesh**

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### **ABSTRACT**

The study was conducted in Guntur district of Andhra Pradesh to identify the training needs of the paddy farmers. A list of 14 major areas of training needs in relation to improved package of practices of paddy cultivation was prepared. Findings revealed that majority Direct sowing of paddy (2.73), Improved varieties of seeds and Plant protection measures (2.67), were the top most training needs and the least training need was identified in the subject related to nursery raising. With regard to days of training majority of the farmers (53.33 %) were willing for the short course of 1-3 days, followed by (33.33%) for 4-7 days, 7-15 days (10%) and a mere 3.33 per cent for more than 15 days. With respect to time of training maximum paddy farmers (66.67 %) opined for Kharif season for training followed by Rabi (33.33 %) season. As far as place of training is concerned 60.00 Per cent of farmers preferred in their own village for training, followed by agricultural college (40%).

**Key words :** Paddy cultivation, Training needs.

## **Effect of Nitrogen on Growth and Yield of Promising Forage Oat Cultivars**

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**Key words :** Green forage yield, Nitrogen levels and Oat varieties

## **Stability Analysis for Grain Quality Parameters in Rice (*Oryza sativa* L.) under Different Fertilizer Managements**

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**Key words :**  $G \times E$  interaction, Quality traits, Rice, Stability analysis.