

# **Development of Bio-computing Portal, Tools and Algorithms for Biological Data analysis in Agriculture – ICAR-IASRI perspective**

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## **Effect of Different Levels of Irrigation and Nitrogen on Yield and Quality of Bidi Tobacco under Rainfed Vertisols of Andhra Pradesh**

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### **ABSTRACT**

An experiment was conducted in a split plot design comprising treatments of three levels of irrigation as main plots (no irrigation, one irrigation of 30mm at 25 DAT (Days After Transplanting) and two irrigations (each 30mm at 25 and 55 DAT) and three levels of nitrogen application as sub plots (90, 110 and 130 kg N ha<sup>-1</sup>). The pooled analysis indicated that more leaf length (41.5 cm), higher cured leaf yield (1741 kg ha<sup>-1</sup>), higher net returns of Rs 38,963 ha<sup>-1</sup> and CBR of 1:1.77 were recorded with two irrigations (each of 30mm) given at 25 DAT and 55 DAT. Fertilizing the crop with 130 kg N ha<sup>-1</sup> resulted in significantly higher plant height (70.7 cm), leaf length (41.4 cm), leaf width (17.4 cm) and cured leaf yield (1696 kg ha<sup>-1</sup>) with net returns of Rs. 36,952 ha<sup>-1</sup>. The economics of irrigation and nitrogen interaction indicated that the maximum Cost Benefit Ratio (CBR) of 1:1.80 with net returns of Rs. 37,765 ha<sup>-1</sup> was produced with the application of 90 kg N ha<sup>-1</sup> with two irrigations (each of 30 mm) at 25 DAT and 55 DAT. The pooled analysis of leaf chemical constituents revealed that chloride content of leaf increased with increase in the level of irrigation and it was significantly higher (1.33%) under two irrigations. Application of 130 kg N ha<sup>-1</sup> recorded significantly higher nicotine content (4.98%) than 90 kg N ha<sup>-1</sup>. Application of 90 kg N ha<sup>-1</sup> coupled with two irrigations (each of 30 mm) at 25 DAT and 55 DAT was found to be optimum for bidi tobacco.

**Key words :** Bidi tobacco, irrigation, nitrogen, cured leaf yield, net returns.

## **Seed Production of Sunnhemp (*Crotalaria juncea* L.) as Influenced by Sowing Time.**

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### **ABSTRACT**

A field experiment was conducted during *rabi*, 2011-12 on clay loam soils of the Agricultural College Farm, Bapatla to evaluate the influence of sowing time on the seed production of sunnhemp (*Crotalaria juncea* L.) in coastal eco system. The crop was sown on 1<sup>st</sup> October, 15<sup>th</sup> October, 1<sup>st</sup> November, 15<sup>th</sup> November, 1<sup>st</sup> December, 15<sup>th</sup> December, 1<sup>st</sup> January, 15<sup>th</sup> January, 1<sup>st</sup> February and 15<sup>th</sup> February respectively. Among the different sowing dates, the crop sown on 1<sup>st</sup> October recorded significantly higher seed yield (1066 kg ha<sup>-1</sup>), stalk yield (4485 kg ha<sup>-1</sup>) gross returns (Rs. 57698 ha<sup>-1</sup>), net returns (40989 ha<sup>-1</sup>), returns per rupee invested (Rs 3.45). The crop sown on 1<sup>st</sup> October received highest heat use efficiency (0.52 and 0.54) than other sowings and lowest was recorded with February sowings (0.19 and 0).

**Key words :** Growing Degree Days, Heat Use Efficiency, Seed yield, Sowing time, *Sunnhemp*.

# **Biomass Production and Decomposition Rate as Influenced By Age of Green Manures and Their Effect on Yield of *Kharif* Maize**

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## **ABSTRACT**

A field experiment was conducted at the Agricultural College Farm, Bapatla, to study the effect of *in-situ* incorporation of dhaincha, sunnhemp and pillipesara green manure at 60, 45 and 30 DAS. Highest biomass production was recorded from 60 days aged dhaincha. Age of incorporation had exerted significant differences in grain yield. Maximum grain yield was recorded when incorporated at 60 days (7871 kg/ha) which was significantly superior to 45 days (7030 kg/ha) and 30 days (6611 kg/ha) incorporation of green manures. Similar results were obtained for other yield parameters such as cob weight and test weight etc. Due to age of incorporation of green manure, maximum undecomposed portion was observed at 60 days (4.57 t/ha) age of incorporation followed by 45 days (1.46 t/ha) and 30 days (0.60 t/ha) age of incorporation, but all these were found to be significantly superior to one and another.

**Key words :** Green manure, Biomass, Undecomposed portion.

# **Yield, Quality and Nutrient Uptake of Different Rice Varieties as Affected By Fym and Fertilizer Treatments.**

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## **ABSTRACT**

An investigation carried out on clay loam soil of Agricultural College Farm, Bapatla during *kharif* season of 2012 to study the effect of different treatments on increasing yield and improving grain quality of rice grain .. The findings of the experiment revealed that the higher grain yield, straw yield, harvest index and nutrients uptake was recorded with the variety, Akshaya (BPT 2231). Quality characteristics of Indra (MTU 1061) manifested supremacy over Swarnamukhi (NLR 145). Significant improvement in productivity and quality characteristics of rice was noticed with soil application of 10 t ha<sup>-1</sup> of FYM along with zinc through foliar spraying twice at panicle initiation and heading stages.

**Key words :** Foliar application, Nutrient Uptake, Rice varieties, Soil application, Quality, Yield.

## **Influence of *Rabi* Legumes and Nitrogen Levels on Growth and Yield of Summer Maize**

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### **ABSTRACT**

A field experiment was conducted for two years in *rabi* and summer seasons of 2011-12 and 2012-13 on sandy clay loam soils of Agricultural College Farm, Bapatla to study the nitrogen requirement of maize when preceded by *rabi* legumes in a legume-maize sequence. Among the *rabi* legumes, greengram performed well and maize responded to nitrogen levels till 300 kg N ha<sup>-1</sup>. Total system productivity in terms of maize equivalent yields (MEY) in legume-maize sequence was more in greengram –maize sequence.

**Key words :** Maize, *Rabi* legumes, Maize equivalent yield, Nitrogen levels.

## **Growth and Yield of Groundnut Genotypes as Influenced by Nutrient levels**

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### **ABSTRACT**

A field experiment was conducted at S.V. Agricultural College, Tirupati (ANGRAU), during *rabi* season of 2012 -13 to study the response of groundnut genotypes to the nutrient levels. The findings of the experiment revealed that the growth, yield attributes and yield were higher with the genotype TCGS-1073 than Rohini, Greeshma and TCGS-1043. Application of 150 % RDF recorded the highest growth, yield attributes and pod yield of groundnut than application of 100 % RDF@ 30:40:50 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>.

**Key words :** Groundnut genotypes, Nutrient levels, Yield.

## **Effect of Poultry Manure on Weed dynamics and Yield of Hybrid Maize (*Zea mays* L.)**

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### **ABSTRACT**

A field experiment was conducted on clay loam soil at the irrigated upland farm of Tamil Nadu Agricultural University, Coimbatore, during *kharif* and *rabi* seasons of 2008 and 2009. The experiment was laid out in a randomized block design with three replications and ten treatments. The results revealed that application of poultry manure significantly influenced the weed dry weights. Lowest dry weights of weeds was recorded with 100 per cent RDF through poultry manure and it was comparable with 50 per cent RDF + 50 per cent RDF through poultry manure. Significantly superior values of grain and stover yield, harvest index were recorded with application of 50 per cent RDF + 50 per cent RDF through poultry manure during both the years of study.

**Key words :** Maize, Poultry manure, Weeds, Yield.

# **Nutrient Uptake, Yield and Post harvest Soil Nitrogen Dynamics of Hybrid Maize (*Zea mays* L.) as Influenced by Plant stand and Nitrogen Management**

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## **ABSTRACT**

Field experiment was conducted to study the effect of plant stand, levels and time of nitrogen application on hybrid maize (*Zea mays* L) for consecutive two wet seasons of 2003 and 2004 at s v agricultural college, Tirupati. Total nitrogen uptake and grain yield of maize deferred significantly due to plant stand, levels and time of nitrogen application during both the years of study. Total N uptake and grain yield was the highest with 83333 plants ha<sup>-1</sup>, which was however comparable with 66666 plants ha<sup>-1</sup>. Total nitrogen uptake and Grain yield was found increased with each increment of nitrogen level up to 240 kg N ha<sup>-1</sup>, but was at per with 180 kg N ha<sup>-1</sup> beyond which the yield not statistically improved. Application of nitrogen as 1/4 basal + 1/4 knee high + 1/4 flag leaf emergence + 1/4 silking, recorded higher N uptake and grain yield which was comparable with 1/3 basal + 1/3 knee high + 1/3 tasselling. With regard to interaction the highest nitrogen uptake and seed yield were obtained with 83,333 plants with 240 kg N ha<sup>-1</sup>, applied as 1/4 basal + 1/4 knee high + 1/4 flag leaf emergence + 1/4 silking which was comparable with 66,666 plants with 180 kg N ha<sup>-1</sup>, applied in three equal splits at basal, knee high and tasselling. Post harvest soil available N status was significantly influenced by plant stands and N levels, while the time of nitrogen application did not exert any noticeable influence during both the years of study. The interaction effect between plant population and N levels during second year and between the plant stands and time of N application as well as N levels and time of application, during first year significantly influenced the post harvest soil available nitrogen.

**Key words :** Maize, Nitrogen, Nitrogen uptake, Plant stand, Yield.

## **Character Association and Path Coefficient Analyses Based on Metric and Physiological Traits in Pigeonpea {*Cajanus Cajan* (L.) Millsp.}**

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## **ABSTRACT**

Forty five genotypes were studied for character association and path analysis. Observations were recorded on 21 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 (%), harvest index, leaf area index (LAI) at vegetative stage, LAI at flowering stage, specific leaf area (SLA) at vegetative stage (cm<sup>2</sup>/g), SLA at flowering stage (cm<sup>2</sup>/g), Specific Leaf Weight (SLW) at vegetative stage (mg/cm<sup>2</sup>), SLW at flowering stage (mg/cm<sup>2</sup>), relative water content (RWC) at vegetative stage (%) and RWC at flowering stage (%). The correlation study indicated that the plant height, days to 50% flowering, days to maturity, number of secondary branches per plant, pods per plant, shelling percentage, harvest index, LAI at flowering stage, SLA at vegetative stage and SLA at flowering stage had significant positive association with seed yield and simultaneous improvement of these characters along with seed yield is possible. Path coefficient analysis revealed that shelling percentage, SLA at vegetative stage, plant height, days to maturity, number of primary branches per plant and pods per plant had showed maximum positive direct effects on seed yield per plant indicating true relationship.

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

## **Genetic Variability and Character Association Analysis in Forage Sorghum (*Sorghum bicolor* L. Moench)**

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### **ABSTRACT**

Genetic variability, correlation and path coefficient analysis was carried out on fifty four sorghum genotypes for fodder yield and related characters. The results revealed that high PCV, GCV, heritability and genetic advance as per cent of mean observed for stem weight, biomass per plant, green fodder yield, green fodder yield per day, dry fodder yield and dry fodder yield per day. Green fodder yield was positively and significantly correlated with early vigour, days to 50 per cent flowering, plant height, leaf length, stem weight, stem girth, biomass per plant and dry fodder yield at both phenotypic and genotypic level. Estimates of direct and indirect effects of component characters on green fodder yield at phenotypic level revealed that biomass per plant contributed maximum direct effect on green fodder yield followed by plant height and leaf length, whereas the study on direct and indirect effects of component characters on dry fodder yield revealed that highest positive direct effect on dry fodder yield was exhibited by green fodder yield followed by plant height. The correlation and path analyses studies when considered together suggested that the traits *viz.*, biomass per plant, plant height, leaf length, stem weight, stem girth, days to 50 per cent flowering should be given importance to isolate superior lines with genetic potentiality for high green forage yield, whereas green forage yield alone could be given emphasis in direct selection for dry fodder yield enhancement.

**Key words :** Correlation, Forage sorghum, Genetic variability and Path analysis.

## **Genetic Association Analysis for Yield, Physiological and Drought Contributing Traits in Mungbean (*Vigna radiata* (L.) Wilczek)**

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### **ABSTRACT**

Correlation and path analyses were carried out with thirty one genotypes of mungbean for different yield, physiological and drought contributing traits. Highly significant positive correlation of seed yield was observed with days to maturity, clusters per plant, pods per plant, seeds per pod, 100 seed weight, harvest index, SCMR and SLA. Path co-efficient analysis revealed that harvest index exhibited maximum direct effect followed by days to maturity and SCMR on grain yield. Hence selection based on these characters would be highly useful for the selection of high yielding and drought tolerant lines in mungbean.

**Key words :** Correlation, Mungbean, Path analysis, Physiological traits.

## **Evaluation of Diversified Male Sterile and Restorer Lines for Combining Ability in Sunflower (*Helianthus annuus* L.)**

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### **ABSTRACT**

The results of the combining ability analysis revealed the importance of non-additive gene action for days to 50% flowering, days to maturity, plant height, head diameter, stem diameter, number of leaves, filled seeds, unfilled seeds, 100 seed weight and oil content, where as both additive and non additive gene action were found to be important for seed yield and oil yield per plant. Most of the characters were controlled by over dominance where, seed yield was controled by complete dominance and partial dominance was seen to for oil yield. The CMS lines IMS WGA and PFMS 400 , were found to be good general combiners for early maturity and dwarf stature. For seed yield, IMS WGA, showed lowest *per se* performance and observed to be good combiner. Though PFMS 400 A and ARM 245 A, recorded high mean seed yield were found to be poor combiners. ARM 245 A showed high *per se* and best general combing for oil content, head diameter and number of leaves. Favorable genes for high oil yield, filled seeds, less number of unfilled seeds and stem diameter were contributed by IMS WGA. Among the testers, 3376 R, was best general combiner for head diameter, 100 seed weight, seed yield, oil content, oil yield and unfilled seeds in desired direction. The tester, R 298, possessed favorable genes for early flowering, maturity and dwarf plant type, while ARM 245 A showed favourable genes for oil content. The cross, IMS WGA x 6D-IR recorded high *per se* performance and SCA effects for seed yield, was also a good specific combiner for 100 seed weight and oil yield, while the cross, PFMS 400 A x R 298, was good spspecific combiner for oil yield, oil content, lower number of unfilled seeds and days to maturity.

**Key words :** Combining ability, Diversified male sterile lines, Sunflower.

## **Character Association and Path Coefficient Analysis in Rice (*Oryza sativa* L.)**

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### **ABSTRACT**

Twenty F<sub>1</sub> crosses along with their parents were used to study the rice grain yield and its component traits by correlation and path coefficients. Character association of the yield attributing traits revealed significant positive association of grain yield per plant with no.of ear bearing tillers per plant. Path coefficient analysis revealed that no.of ear bearing tillers per plant, test weight, panicle length and days to 50 % flowering exhibited positive direct effect on grain yield per plant. On other hand plant height showed negative direct effect on grain yield per plant. Among these characters no.of ear bearing tillers per plant possessed both positive association and high direct effect. Hence, selection for this trait could bring improvement in yield.

**Key words :** Character association, Path Analysis, Riceand.

# **Character Association and Path Coefficient Studies on Yield and Yield Contributing Traits in Finger Millet [*Eleusine coracana* (L.) Gaertn.]**

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## **ABSTRACT**

Correlation studies involving forty three genotypes of finger millet indicated that productive tillers per plant, 1000-seed weight, fingers per ear, finger length, ear weight per plant and plant height were significant and positively associated with seed yield per plant. The path analysis revealed that productive tillers per plant had maximum direct effect on seed yield per plant followed by 1000-seed weight, fingers per ear and ear weight per plant. Considering the nature and magnitude of character associations and their direct and indirect effects, it can be inferred that productive tillers per plant, 1000-seed weight, fingers per ear and ear weight per plant could serve as important traits in selecting high yielding genotypes in finger millet.

**Key words:** Correlation, Finger millet, Path analysis

# **Genetic Variability and Interrelationships among Phenological, Quality and Yield Parameters in Yellow Grain Quality Protein Maize (QPM) (*Zea mays* L.)\***

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## **ABSTRACT**

The data on a total of 26 different phenological, quality and yield attributes of yellow grain quality protein maize (*Zea mays* L.) were recorded on ten parents and their 45 direct single crosses developed through diallel mating along with two standard checks viz., DHM-105 and Shaktiman-2 during *Kharif* 2003 and *Kharif* 2004 at two locations (Hyderabad and Allahabad). In this study, out of 26 characters studied, grain yield and its component characters viz., total anthers dehescence period, total period of silk appearance, active pollination period, number of seeds per cob, cob weight, protein yield and oil yield had expressed high estimates of GCV and PCV and high heritability (more than 85 per cent) coupled with high genetic advance with highly positive and significant phenotypic and genotypic correlations with grain yield, indicates that the genetic variances for these traits are probably owing to their high additive gene effects and hence, it is inferred that, there is a better scope for improvement of these traits through direct selection.

**Key words :** Genotypic correlations, Heritability, Quality Protein Maize, Phenotypic correlations.

## **Fertility Status and Physico-Chemical Properties of Soils of Pamidimukkala Mandal, Krishna District, A P.**

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### **ABSTRACT**

An investigation was carried out to study the physico-chemical characteristics and fertility status of the soils in Pamidimukkala mandal of Krishna district, Andhra Pradesh. The study revealed that the pH of the soils ranged from 6.87 to 8.74, electrical conductivity from 0.22 to 2.64 dS m<sup>-1</sup> and organic carbon from 0.38 to 1.21 %. The availability of copper, iron and manganese in these soils was well above their critical limits, while the zinc was found to be below the critical limit in 25% of the samples.

**Key words :** Critical limit, Fertility status, Physico-chemical properties, Micro nutrients.

## **Studies on Genetic Variability, Character Association and Path Co-Efficient Analysis in Cowpea [*Vigna Unguiculata* (L.) Walp]**

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### **ABSTRACT**

Genetic variability, heritability, genetic advance, correlation and path coefficient analysis were carried out for forty genotypes of cowpea for 18 yield component and seed quality traits. Heritability in broad sense was high for number of clusters per plant and days to 50 per cent flowering indicate the presence of additive gene effects. Phenotypic and genotypic coefficients of variation were high for the seed yield per plant followed by pods per plant, length of main branch and number of clusters per plant. Positive correlation was found between seed yield and pods per plant, number of clusters per plant, number of seeds per pod, number of primary branches. Path analysis showed high positive direct effects on pods per plant, number of primary branches and number of seeds per pod. Pods per plant, number of clusters per plant, number of seeds per pod and number of primary branches were identified as selection criteria for improving yield and component characters in cowpea breeding programmes.

**Key words :** Correlation, Cowpea, Path analysis, Seed quality, Variability, Yield.



# **Effect of Time of Insecticidal Spray on the Incidence of Bud Necrosis and Stem Necrosis Diseases of Groundnut**

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## **ABSTRACT**

Field experiment was conducted for the management of groundnut bud necrosis disease (GBND) and peanut stem necrosis disease (PSND) in groundnut. Among nine treatments tested during *rabi* 2013-14, insecticidal spray with imidacloprid SL @ 0.0053% at 45 DAS recorded the lower incidence of GBND (3.66%), PSND (2.02%) and average thrips population per plant (4.80) and was on a par with fipronil spray SC @ 5% at 45 DAS. Significant increase in shoot length, number of pods per plant, dry pod yield, 100 seeds weight, shelling percentage and highest B:C ratio was recorded with imidacloprid SL @ 0.0053% at 45 DAS and fipronil SC @ 5% at 45 DAS. Insecticidal protection at 45 DAS was found to be effective and economical in control of both the diseases and thrips population.

**Key words :** Bud necrosis, Groundnut, Insecticides, Stem necrosis, Thrips population.

# **Monitoring the Population Dynamics of Brinjal Shoot and Fruit Borer (*Leucinodes orbonalis* Guen.) Through Pheromone Traps in Relation to Different Ecological Parameters**

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## **ABSTRACT**

Adult populations of brinjal shoot and fruit borer (BSFB), *Leucinodes orbonalis* Guenee were monitored through pheromone traps for two consecutive winter seasons of 2009-10 and 2010-11 in Keonjhar district of Odisha. It was observed that the pest made its first appearance during 41<sup>st</sup> Standard Week 2<sup>nd</sup> week of October and was active up to 11<sup>th</sup> Standard Week 2<sup>nd</sup> week of March in both the years of study. The first peak population level was noticed during 50<sup>th</sup> Standard Week and 48<sup>th</sup> SW, respectively in 2009-10 and 2010-11. However, the second peak was observed during 7<sup>th</sup> Standard Week in both the years of experiment. The correlation studies on abiotic factors and pheromone trap catch revealed that maximum temperature exhibited a significant positive correlation, whereas, relative humidity (both morning and afternoon) and rainfall were negatively correlated with the adult population level of BSFB. However, the extent of variation in adult trap catch due to the multiple interactions of abiotic factors was estimated to be 48.0 % during 2009-10 and 64.8 % during 2010-11 and among the abiotic factors, temperature and relative humidity played maximum role in adult population fluctuation.

**Key words :** Abiotic factors, Brinjal, *Leucinodes orbonalis*, Pheromone trap.

## Identification of Suitable Intercrops that suppresses the Insect pests of Maize (*Zea mays* Linn.)

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### ABSTRACT

A field trial was conducted at farm of S. V. Agricultural College, Tirupati to find out suitable intercropping systems that suppresses insect pests population in maize, during *Kharif*, 2012. The intercropping systems studied were maize + black gram, maize + green gram, maize + cowpea, maize + groundnut, maize + cluster bean, maize + field bean. Pure maize crop was also maintained. Sucking pests like Shoot bug, Sugarcane leaf hopper and aphids were predominantly recorded during crop growth period. Shoot bug population was observed lowest in maize +field bean (0.92/Plant) and was succeeded by Maize + cluster bean (1.02/plant). Sugarcane leaf hopper density was observed lowest in maize + cluster bean system (0.61/plant), followed by maize + groundnut system (0.63/plant) and Maize + field bean (0.84/Plant). Aphid population was found in tasseling and cob formation stage. Lowest numbers were found in maize along with cluster bean intercropping system (19.39/plant) followed by maize + groundnut (20.47/plant).

**Key words :** Maize, shoot bug, sugarcane leaf hopper, aphids, intercropping, sole crop.

## Management of Pigeonpea Pod Borer Complex with Bio Rational Insecticides

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### ABSTRACT

The field experiments was under taken on “Management of pigeonpea pod borer complex with bio rational insecticides” during *Kharif* 2009 at Regional Agricultural Research Station, Lam, Guntur. Results indicated that among seven bio-rational insecticides evaluated for their efficacy against pod borer complex, treatments like *Bacillus thuringiensis* (Ber.) @ 2 ml/l (34.38%) and NSKE @ 5% (31.33%) were effective in suppressing the inflorescence damage. *Bt* @ 2ml/l and NSKE 5% were on par with each other with least pod damage by *M. vitrata* (7.09% and 7.48%), *H. armigera* (2.94% and 2.97%) and *M. obtusa* (5.43 % and 7.31%), respectively. The chemical check chlorpyrifos + dichlorvos @ 2.5 + 1ml/ l recorded 42.96% inflorescence damage and 6.76, 2.09 and 4.25 per cent pod damage due to *M. vitrata*, *H. armigera* and *M. obtusa*, respectively and was significantly superior over other treatments. Higher yield was recorded in *Bt* @ 2 ml/l (999.87 Kg/ha) followed by NSKE 5% (955.53 Kg/ha) with 102.23 and 93.25 % increase over control. The highest yield was recorded by the chemical check chlorpyrifos + dichlorvos @ 2.5 + 1ml/l (1263.67 Kg/ha) with 155.58 % increase over control and significantly superior over other treatments

**Key words :** Biorational insecticides, *Helicoverpa armigera*, *Maruca vitrata*, *Melanagromyza obtusa*, Pigeonpea, Podborer complex.

# **Influence of Weather Parameters on the Incidence of American Bollworm, *Helicoverpa Armigera* (Hubner) on *Bt* and non-*Bt* Varietal Cottons**

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## **ABSTRACT**

Studies on impact of weather parameters on the incidence of American bollworm, *Helicoverpa armigera* (Hubner) on *Bt* and non-*Bt* varietal cottons were carried out at Department of Entomology, Agricultural College, Bapatla in collaboration with Regional Agricultural Research Station, Lam, Guntur during two seasons, *khari*f 2009-10 and *khari*f 2010-11. American bollworm larval population was completely absent on stacked *Bt* cotton hybrids (RCH 2 BG II and Mallika BG II) compared to higher larval population (0.04-0.42 larvae/plant) in L 604 non-*Bt* during 40<sup>th</sup> (Oct.1-7)-52<sup>nd</sup> (Dec.24-31) std. weeks with its peak (0.42 larvae/plant) during both 45<sup>th</sup> and 46<sup>th</sup> std. weeks. The favourable weather parameters that influences the build up of high population of American bollworm (44<sup>th</sup> to 46<sup>th</sup> std. weeks) are in the range of maximum and minimum temperatures 29-32 and 21-23°C, morning and evening relative humidities 87-91 and 71-87 per cent, and the rainfall 24-28 mm. Evening relative humidity exerted highly significant positive ( $r=0.699^{**}$ ) influence on the American bollworm incidence in L 604 non-*Bt*. All the weather variables *viz.*, maximum and minimum temperatures, morning and evening relative humidities, and rainfall) together contributed to 56.3 per cent variation in American bollworm larval population non-significantly ( $R^2=0.563$ ) in L 604 non-*Bt*.

**Key words :** American bollworm, *Bt* and non-*Bt* varietal cottons, Weather parameters.

# **Knowledge, Adoption and Economics of Integrated Pest Management in Paddy in Vizianagaram District, Andhra Pradesh.**

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## **ABSTRACT**

On-farm demonstrations of IPM in paddy were carried out by DAATT Centre (District agriculture advisory and transfer of technology centre) in Vizianagaram district, Andhra Pradesh for suppressing the crop pests; reducing the cost of production to farmers and ensuring quality produce to the consumers. IPM verification trials were conducted under farmer's conditions as well as large scale implementation of IPM through farmers' participatory approach at five villages in Vizianagaram district of Andhra Pradesh. Adoption of IPM practices resulted in increase in rice yield from 5.45 to 6.33 tonnes/ha in Vizianagaram district during *khari*f, 2007, 2008 & 2009. The cost of plant protection using IPM in paddy is reduced by 31.5% as compared to farmer's practice of plant protection. The cost-benefit ratio of rice is 2.17 in IPM farmers as compared to 1.85 in Non-IPM farmers. Knowledge and adoption of IPM in paddy was studied in five villages consisting of 20 IPM farmers and non-IPM farmers. Majority of IPM farmer's (50%) had high extension contact and majority of non-IPM farmers had (54%) medium extension contact. Majority of IPM farmers (38%) having medium farm holding and majority of non-IPM (44%) were small farmers. Fifty two per cent of the IPM farmers possessed high knowledge level and remaining farmers possessed medium (36%) and low (12%) level knowledge regarding paddy IPM practices. Whereas forty four percent of non-IPM farmers possessed medium level of knowledge followed by high (40%) and low (16%) level of knowledge on paddy IPM. Forty percent of IPM farmers had high adoption level and forty eight percent of IPM farmers had medium adoption level. Thirty two per cent of non-IPM farmers had high adoption level of IPM practices followed by medium level adoption (28%). The success of IPM technology through demonstrations were found to be more suitable in increasing the knowledge and adoption level of the paddy farmers.

**Key words :** Adoption, Economics, IPM in paddy. Knowledge.

## **Evaluation of Different Neem Products Against *Aproaerema modicella* (Deventer) and *Spodoptera litura* (Fabricius) in Groundnut**

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### **ABSTRACT**

Field studies were carried out to evaluate six different neem derivatives against major defoliator pests infesting groundnut viz., leaf miner, *Aproaerema modicella* (Deventer) and tobacco caterpillar, *Spodoptera litura* (Fabricius) during *Rabi* 2011-12 in comparison with an insecticidal check, Quinalphos 25EC. The results revealed that Quinalphos 25EC was found to be significantly superior to all other tested neem derivatives in suppressing *A. modicella* and *S. litura* larval population with a maximum mean per cent larval population reduction of 66.91 and 57.31, respectively over untreated check. Neem Seed Kernel Extract (NSKE) 5% was found to be the effective treatment among the different neem derivatives tested in suppressing the larval population of *A. modicella* (43.17%) followed by neemazal 10000ppm (33.23%), neem oil (31.56%), neem leaf extract 5% (31.24%) and nivaar 1500ppm (30.20%), respectively. Whereas, NSKE 5% was found to be superior in bringing down the larval population of *S. litura* (42.25%) followed by neem oil (31.87%), neem leaf extract 5% (28.85%), neemazal 10000ppm (27.26%) and nivaar 1500ppm (25.26%), respectively.

**Key words :** Groundnut, Leaf miner, Tobacco caterpillar, Neem derivatives.

## **Studies on Field Incidence of Thrips on *Kharif* Groundnut in Relation to Weather Parameters**

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### **ABSTRACT**

Investigations were carried out to study the incidence of thrips in different areas during *Kharif*, 2011. The fixed plot survey conducted at S.V. Agricultural college farm, Tirupati and ARS, Kadiri revealed that maximum temperature, minimum temperature and wind speed had significant positive influence on thrips incidence when groundnut was sown during first fortnight of July in both the cultivars i.e., Narayani (+0.67, +0.39, +0.32) and K-6 (+0.67, +0.39, +0.32), morning relative humidity and evening relative humidity showed significant negative influence in Narayani (-0.57, -0.35) and K-6 (-0.56, -0.36), respectively.

The data analyzed by using step down regression revealed that rainfall, rainy days, sunshine hours and wind speed together influenced to an extent of 90 ( $R^2=0.90$ ) and 89 ( $R^2=0.89$ ) per cent of foliar damage due to thrips in D1 (29-06-11)sown Narayani and K-6 cultivars of groundnut crop. In case of Narayani sown in D2 (11-07-2011), maximum temperature, minimum temperature rainy day and wind speed influenced to the extent of 70 per cent ( $R^2=0.70$ ), and incase of K-6 maximum temperature, minimum temperature, evening relative humidity and rainy day influenced to 73 per cent ( $R^2=0.73$ ). Whereas, in D3 (25-07-2011)sown Narayani and K-6 morning relative humidity, evening relative humidity and rainfall resulted in 84( $R^2=0.84$ ) and 87( $R^2=0.87$ ) per cent thrips incidence of thrips with respect to the above weather parameters.

**Key words :** Groundnut, *Kharif* 2011, Thrips Incidence.

# **Performance of Different Genotypes of Guar (*Cymopsis Tetragonaloba* (L.) Taub) Under Agro-Climatic Conditions of North Coastal Zone of Andhra Pradesh**

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## **ABSTRACT**

Guar (*Cymopsis tetragonaloba*(L.)Taub) known as drought tolerant annual crop having high export value for its edible guar gum powder. The crop is having wider adaptability, to introduce in the non-traditional area a study has been taken up to identify suitable genotype/variety for the local agro-climatic conditions of north coastal zone of Andhra Pradesh. An experiment was conducted at RARS, Anakapalli, Viskhapatnam district. The 20 genotypes viz., RGM-111, RGC-936, G-32, GG-1, G-36, G-37, GAUG-9005, GAUG-9003, HG-56-3, RGC-1002, RGC-986, RGM-112, G-16, G-42, RGC-1025, G-39, G-28, G-3, G-4 and G-5 was studied with 2 replications in RB Design for the vegetative growth, seed yield and seed quality. The parameters like plant height, number of branches per plant, days to 50% flowering, number of days taken to maturity, number of pods per plant, number of seeds per pod and seed yield per hectare were observed. Similarly, the observations were recorded for the purpose of gum powder for their quantitative characters viz., weight of the endosperm, weight of non-endosperm, weight of gum at semi solid state, recovery percentage of endosperm and weight of the gum powder from the unit of the seed sample. Among the genotypes, the highest seed yield of 937.98 Kg/ha in the genotype RGM-111 followed by GG-32 (627.67 Kg/ha) which is on par with the genotype RGC-936 (624.97 Kg/ha) was recorded. The significant highest weight of the endosperm 30.25g in RGC-986 followed by RGM-111 (28.75 g) was recorded. Similarly, the significant highest weight of gum powder 25.40 g in RGM-111 followed by RGC-986 (24.90g) was recorded. Further it is concluded that for the seed yield of the genotypes RGM-111 and RGC-93 and for the recovery percentage of endosperm and also for the weight of the gum powder the genotype RGM-111 and RGC-986 is found superior for guar cultivation in the local agro-climatic conditions of North Coastal Zone of Andhra Pradesh.

**Key words :** Agro Climatic, Genotypes of Guar.

## **Studies on Nature and Magnitude of Genetic Divergence in Bottle Gourd (*Lagenaria siceraria* Mol Standl.) using D<sup>2</sup> Analysis\***

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## **ABSTRACT**

An experiment was conducted to study the nature and magnitude of genetic divergence of twenty four bottle gourd genotypes obtained from NBPGR, Hyderabad along with one check variety i.e. Pusa Naveen sown in Randomized Block Design (RBD) with three replications during spring summer 2012. The genotypes were grouped into five different clusters using D<sup>2</sup> analysis. Cluster III possessed maximum number of genotypes (11) followed by the cluster IV (8). Maximum inter cluster distance was observed between cluster II and V and minimum between III and IV clusters. In case of intra cluster distance, the maximum distance was observed in cluster III and it was zero in solitary clusters like cluster II and V. Based on cluster mean, the genotypes of cluster II followed by cluster I recorded highest mean for yield per vine and other yield attributing traits. Selection of superior genotypes with desirable traits and with high genetic distance could be selected for hybridization programmes and recognition of best genotypes for different traits to produce new elite recombinants in bottle gourd.

**Key words :** Bottle gourd, Cluster, D<sup>2</sup> analysis, Genetic diversity.

## **Path Analysis of Some Yield Contributing Traits in Ash Gourd (*Benincasa hispida*(Thumb)Cogn.)**

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### **ABSTRACT**

A total of forty ash gourd collected from different parts of India were studied during kharif season of 2007 and 2008. The data for correlation and path coefficient analysis were recorded for eight characters viz., days to first male flowering, days to first female flowering, number of node at which first male flower appears, number of node at which first female flower appears, number of male flowers, number of female flowers, number of fruits and total fruit yield/plant. The results revealed that genotypic coefficient of variation was lower than corresponding phenotypic coefficient of variation for all the characters studied. High estimates of heritability was recorded for days to first female flowering, days to first male flowering, yield/plant and node at which first female flower appears. Majority of the characters possessed higher genotypic correlations than their corresponding phenotypic values. It may be suggested that an indo-type plant of ash gourd for maximization of fruit yield should have early female flower appearance, number of female flowers and number of fruits.

**Key words :** *Benincasa hispida*, Path analysis, Yield traits.

## **Flowering and Flower Characters as Influenced by Planting Geometry in Garland Chrysanthemum (*Chrysanthemum coronarium* L.)**

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### **ABSTRACT**

Flowering delayed significantly by increasing the spacing level from  $S_{30 \times 30}$  to  $S_{60 \times 60}$ . The flower yield per ha was found to be highest at  $S_{30 \times 30}$  level which is at par with  $S_{30 \times 40}$  level in both *kharif* and *rabi* seasons. The number of flowers per plant was increasing as the plants were widely spaced, highest being recorded at  $S_{60 \times 60}$  level. The increase in mean flower weight was not significant, though it was observed in widely spaced plants. Quality parameters, viz. mean flower diameter, hundred flower weight as well as thousand seed weight increased with increasing levels of spacing from  $S_{30 \times 30}$  to  $S_{60 \times 60}$ , but the differences were found to be statistically non-significant.

**Key words :** Flower yield, Garland chrysanthemum, Planting geometry and Quality.

## **influence of Plant Growth Promoters and Systems of Growing on Physiological Parameters of *Dendrobium* cv. Earsakul**

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### **ABSTRACT**

*Dendrobium* is an important orchid for cut flower and potted plant production. The study on 'Growth and physiological response of *Dendrobium* cv. Earsakul in different growing conditions' was conducted at College of Horticulture, Vellanikkara, Kerala. The experimental results revealed that, among physiological parameters, leaf area was highest in the treatment POP + OM + VW + PGPRES + Bone meal + GR in both stages of plants. Rate of photosynthesis and transpiration rate during day time were highest in the treatment POP + OM + VW + PGPRES + Bone meal in six month old plants. Rate of transpiration during day time was highest in the treatment NPK + GR + OM + VW + PGPRES + Bone meal in three year old plants. Among the three systems of growing, maximum values for physiological parameters were recorded in top ventilated polyhouse (S<sub>2</sub>). The interaction of plant growth promoters and systems of growing had significant effect on physiological parameters.

**Key words :** *Dendrobium* cv. Earsakul, Inorganic nutrients, Plant Growth Promoting Root Endophyte (*Piriformospora indica*) and growing systems.

## **Forecasting of Area, Production and Productivity of Jowar in Andhra Pradesh Using Growth Models**

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### **ABSTRACT**

This paper attempted to identify the trend of area, production and productivity of Jowar(Sorghum) in Andhra Pradesh through fitting different Linear, Non-Linear Growth models. Influence of weather parameters on area, production and productivity of Jowar crop by using Karl Pearson's correlation and Multiple Linear Regression Analysis was also studied. From the best fitted model forecasting of area, production and productivity was also done. Cubic model was identified as the best model for the observed data and forecasting was done for the Jowar area, production and productivity up to 2020 AD. It was observed that there was an increasing trend in the productivity, but both area and production was in the decreasing trend during the study period.

**Key words :** Adj.R<sup>2</sup> and MAPE, Karl Pearson's correlation coefficient, Linear and Non-Linear growth models, Multiple Linear regression, Theil's U-Statistic, R<sup>2</sup>.

## **Changes in Physicochemical and Microbial Properties of Sweet Oranges from Harvest to Spoilage**

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### **ABSTRACT**

Freshly harvested sweet oranges were stored at ambient condition (R.H: 72-83%; Temperature: 26-29°C) without any treatment and different Physico-chemical and microbial properties were studied during September, 2012-13 at Post Harvest Technology Centre, Agriculture college campus, Bapatla until quality deterioration was observed. Physiological Loss of Weight (PLW) increased gradually during the storage period. Average fruit weight decreased from 154.50 to 132.05g. Juice content of the fruit has been decreased from 46.28 to 34.38%. Firmness has been found declining initially up to 17 days, later it increased slightly due to desiccation resulting in drying or toughening of peel. Total Soluble Solids (TSS) has been increased from 7.50 to 9.24%. Reducing sugars increased from 1.22 to 2.32 %. Ascorbic acid content, total acidity, phenol content were found decreasing. Ascorbic acid content has been decreased from 38.55 to 27.42 mg/100g. Phenol content in juice has been increased from 16.49 to 17.43 mg/100g. Acidity has been decreased from 0.91 to 0.53 %. The surface microbial load showed a gradual raise in number of colonies during the storage period. Findings indicated that sweet oranges can be stored at ambient condition without any treatment up to 3 weeks with a minor loss of quality.

**Key words :** Ascorbic acid content, Phenol content, Reducing sugars, Sweet Orange, Storage, Surface microbial load, Titrable acidity.

## **Water Production Efficiency of Groundwater in Hirekere Watershed in Raichur District in Karnataka**

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### **ABSTRACT**

The present study was taken up in Hirekere watershed which is draining to Krishna river through Nallavagu stream and is located near Singanodi and Mandalgeri villages in Raichur district of Karnataka. The physiography is gently sloping. The normal rainfall of the study area is 632 mm. The mean maximum temperature varies from 30.3°C in December to 40.6°C in May while the minimum temperature ranges from 15.7 °C in December to 25.3 °C in May. The soil is covered by *Alfisols* of red sandy loam. From the study of water production efficiency of groundwater usage farmers it was found that the farmers' practice of water application was 1.30 times more than the actual water required. It was also revealed that there is a need for better management of irrigation scheduling and operation such that excessive irrigation is to be minimized. The depth of application during each irrigation needs to be measured with suitable devices like H-flumes, Parshall flumes, V-notches etc which will minimize the excessive irrigation.

**Key words :** Groundwater, Water Production Efficiency, Watershed.



## **On-farm Demonstration of Ananta Groundnut Planter in Farmers Fields of Ananthapuram District**

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### **ABSTRACT**

On-farm demonstrations were conducted in 17 villages of Anantapuram district in an area of 6.8 hectares during kharif season over a period of 5 years from 2008-09 to 2012-13. Two types of sowing machinery i.e, Ananta groundnut planter and bullock drawn seed drill were used for sowing of groundnut. Demonstrations revealed that the recommended seed rate of 100 kg ha<sup>-1</sup> was dropped by the Ananta groundnut planter due to well designed metering mechanism, while it was not possible in bullock drawn seed drill because of manual dropping of seed. Higher plant height, yield attributes and 6.5 per cent more yield of groundnut was recorded with Ananta groundnut planter compared to bullock drawn seed drill. Pod yield 767.8 kg ha<sup>-1</sup> was obtained with Ananta groundnut planter. It was 720.8 kg ha<sup>-1</sup> with bullock drawn seed drill.

**Key words :** Ananta groundnut planter, Groundnut, Tractor drawn seed drill.

## **Constraints in Implementation of the MGNREGS by Different Stakeholders in Andhra Pradesh**

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### **ABSTRACT**

In India, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is one of the major rural development programmes. Which it provides guaranteed employment to the rural households for 100 days in a year. This paper has attempted to find out the constraints faced by the MGNREGS beneficiaries in Andhra Pradesh. The important constraints faced by the beneficiaries were delay in wage payment, delay process in post office and non availability of regular works in Andhra Pradesh. Hectic process of post office is the major administration problem in Anantapur district which was delay in wage payment (81.67%) was occurring. In Mahabubnagar also delay in wage payment (100%) regarded as the main administration problem. In Srikakulam district 83.67% of stakeholders stated that delay in wage (83.67%) payment as the main administration constraint. Overall 89.44% of stakeholders indicated delayed in wage payment as the main administration constraint followed by hectic process of post office (83.33%).

**Key words :** Constraints, Implementation, MGNREGS, Post office, Stakeholders, Wagepayment.

## **Land ownership and Decision Making Pattern of Farm Women: A Field Study in Medak District of Andhra Pradesh, India**

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### **ABSTRACT**

The present study was conducted in Medak district of Andhra Pradesh, India to study and quantify the decision making pattern of the farm women with and without land ownership and to identify the factors which contributed positively and negatively in holding the land ownership with a sample of 50 women having 25 in each group. Results of the study revealed that there was a distinct difference between the two groups of women in decision making pattern. Out of the total 15 identified farm decisions, women with land ownership were more independent in 14 decisions than the women without land ownership with an average difference of 11.2 per cent. Age of the women, their respective village literacy level, individual education level and family size respectively were the factors that played significant role in acquisition of the land ownership in the study area in descending order of magnitude and discriminated between the two groups. It was concluded from the study that the land ownership of the farm women has very clear impact on decision making pattern which denote their empowerment level and confirmed that enhancing the education levels of the farm women and over all literacy rate of the villages is required to improve the percentage share of the land holdings by the farm women for empowerment of women in agriculture.

**Key words :** Discriminant function analysis, Decision making pattern.

## **Cost Structure of Swine Farms under Rashtriya Krishi Vikas Yojana (RKVY) Project**

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### **ABSTRACT**

The cost structure and returns of swine farms was studied during 2009-10, 2010-11 and 2011-12 at S V V U, Tirupati, under RKVY project. It was found that the total costs of swine farms per unit decreased from Rs.36,070 to Rs.27,888 from first year to third year. The pattern of returns indicated that the net returns ranged from Rs.7442 to Rs.26741 per unit during the period of study. The returns per rupee of outlay have risen from 1.21 in first year to 1.96 in third year. The Net Present Worth (NPW) and Benefit-Cost ratio of the enterprise were Rs.2,15,247 and 1.27, respectively at 12% discount rate. Internal rate of return (IRR) stood at 99.36%.

**Key words :** BCR, IRR, NPW, RKVY, Swine farms.

## **Extent of Awareness and Adoption Level of Technologies by the Beneficiaries of Agricultural Technology Management Agency (ATMA) Programme in Dimapur District of Nagaland, India**

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### **ABSTRACT**

In Nagaland ATMA programme has been working as a district level society since 2005-06 in disseminating agricultural technologies at district level. Present study was conducted to ascertain the extent of awareness and adoption level of some important technologies by ATMA beneficiaries in Dimapur district of Nagaland covering two rural development blocks. Altogether 80 respondents were selected for the study from different SHGs. Study revealed that 43.75 per cent of the total respondents were found aware about all selected five technologies, 18.75 per cent were aware of four technologies and 16.25 per cent reported not aware about all the five technologies. Although the level of awareness on all the five selected technologies was increased after ATMA intervention, a maximum percentage of respondents did not adopt the technologies. Only 6.25 per cent respondent have adopted all the five technologies against 21.25 per cent did not adopt at all.

**Key words :** ATMA, Awareness, Adoption, Technology.

## **An Economic Analysis of Sugarcane Cultivation in Nellore District, Andhra Pradesh**

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### **ABSTRACT**

The per hectare cost of cultivation of sugarcane planted and ratoon worked out to Rs. 1,06,68, Rs. 76,827, and Rs. 1,13,117 on planted crop and Rs. 80,986, Rs. 1,09,895 and Rs. 78,907 for ratoon crop on small, large and combined farms respectively, thus exhibiting positive relationship with the size of the farm. The cost of producing a tonne of sugarcane planted and ratoon showed inverse relationship with the size of the holding, Rs. 1,016 and Rs. 778 on small farms and Rs. 1,005 and Rs. 762 on large farms. The net income from sugarcane planted and ratoon increased from Rs. 6,727 to Rs. 29,822 on small farms and from Rs. 8,383 to Rs. 33,764 on large farms respectively.

**Key words :** Cost of cultivation, Costs and returns, Sugarcane.

# **Profile Characteristics of Students and 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 identify the profile characteristics of students and teachers. The study was conducted by adopting the Ex - post - facto research design. The respondents for the study include all teachers (56) and all final year B. Sc (Ag.) students (90) on rolls as on the date of study in the selected campus. The findings of the study revealed that majority of the respondent teachers were males with middle age, Assistant Professors having doctorate degrees, came from rural background, with Agriculture as their parental occupation, medium from the point of their teaching experience, belonged to low category with regard to trainings received. Majority of the respondent students were males, rural in background with above 8.0 Grade Point Average (GPA).

**Key words :** Characteristics of students, Profile.

# **Adoption Level of Poly Culture Fish Practices in Southern Andhra Pradesh**

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## **ABSTRACT**

The present study was carried out during 2013-2014 in the purposively selected Krishna, Guntur and Prakasam districts of southern Andhra Pradesh focused on the factors influencing adoption of fish farmers towards poly culture fish practices. The findings revealed that majority (82.86%) of fish farmers belonged to medium to high adoption category. The adoption of fish farmers towards poly culture fish practices was positively and significantly influenced by the factors like, education, occupation status, socio economic status, social participation, possession of fishing equipments, annual income, size of land holding, risk orientation, scientific orientation, innovative proneness, extension participation, extension agency contact, mass media participation, size of water body, distance of water body to the residence, extent of weed infestation and negatively by their age and economic performance. Economic performance, risk orientation, scientific orientation, innovative proneness and extension participation are significant with adoption level in multiple regression.

**Key words :** Adoption, Fish farmers, Poly culture fish practices, Multiple regression.

## **Use of Internet among Under Graduate Students in Agricultural College Bapatla**

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### **ABSTRACT**

This study bapatla was carried out in order to determine usage of Internet by the undergraduate students of Agricultural college of Guntur district of Andhra Pradesh. Data was obtained from 30 undergraduate students of the institution with the use of a questionnaire. The study revealed that majority of the students belong to the range of 7.1-8.0 overall grade point average. It is also revealed that most of the respondent parents were government employees (56.66%). The study indicated that most of the respondent parents have annual income greater than one lakh (56.66%) and place of education is from urban (70%). Regarding computer knowledge at school revealed that most of the students are having knowledge at their school level (80%). Majority of the students (90%) are having personal email, and majority (63.33%) of them gained computer knowledge by self-learning. Most of them using internet through own computers (63.33%) with respect to experience 46.66per cent had 3-5 years of experience in internet usage, among the internet services study material (83.33%) has been chosen as the best internet service and 40.00 per cent of the respondents feel fully satisfied with the internet facility, (70.00%) respondents browse Google products. With respect to factors contributing to improving internet usage was to provide increase bandwidth in order to speed up the network connection because majority of them expressed that there was a slow speed access to internet.

**Key words :** Electronic mail, Internet, Power point, World Wide Web.

## **Evaluation of Growth, Yield and Quality of Conventional Cotton (*Gossypium hirsutum* L.) Hybrids in Comparison to Bt Hybrids**

P Raghu Rami Reddy and B Dileep Kumar

**Key words :** Conventioanl cotton, Evaluation of growth, Hybrids and Yield.

## **Constraints Experienced by the Farmers in Mango Production**

M S Rao, Ch Sunitha, N Ratnakumari and M Satyanarayana

**Key words :** Constraints, Framers and Mango Production.