M.Sc. (Horticulture)

1) “Study on the vegetative propagation of guava (Psidium guajava L.) Through air and stool layering” - Mr. Heiplanmi Rymbai.

ABSTRACT
The present experiments were carried out at Horticultural Research Station, Sangareddy, Medak district, Andhra Pradesh, from the first week of May to first week October for stool layering and 15th June to 15th December, 2008 for air layering on guava cv. L-49.

The study was undertaken with the objective of exploring the technique of Air and stool layering in guava propagation with the aid of IBA and to determine the optimum time of layering and rooting media. For air layering the operation was done in 3 months i.e. 15th June, 15th July and 15th August and the period of observations were 75 days after layering. In stool layering, heading back was done in the first week of May and mounding with moist soil was done in August first week. The observations were made at 60 days after mounding. In both the experiments observations for establishment percentage was taken at 45 days after transplanting.

Treatment with IBA at 4000 ppm in 15th August and wet sphagnum moss as rooting media resulted highest percentage of successful layers, maximum number of primary and secondary roots and their mean length of longest roots, maximum fresh and dry roots weight, and maximum percentage of establishment of rooted air layers both under Open and poly house conditions.

In stool layering, IBA at 7000 ppm treated shoots recorded the maximum percentage of successful layers, more number of primary and secondary roots, maximum mean length of longest roots, highest fresh and dry roots weight, and maximum percentage of establishment of rooted air layers both under Open and poly house conditions.


ABSTRACT
China aster [Callistephus chinensis (Linn.) Ness] belongs to one of the largest families of flowering plants, ‘Asteraceae’. China aster is a free blooming half hardy, easy growing winter annual grown for cut as well as for loose flowers. The cut flowers have good vase life and are used in flower arrangements, vases, bouquets, for interior decorations etc. The loose flowers are widely used for making garlands, for decorations, for worship and are also used in social functions.

A field experiment was conducted during Kharif, 2008-09 to study the “Studies on the performance of China aster [Callistephus chinensis (Linn.) Ness] varieties under Hyderabad conditions” grown on red sandy loam soil at All India Coordinated Research Project on Floriculture, Agricultural Research Institute, Rajendranagar, Hyderabad. The experiment was laid out in randomized block design with seven treatments replicated thrice.

All the cultivars performed with wide and significant differences for all the parameters studied i.e. their growth, quality and yield.

The cultivar ‘Phule Ganesh Violet’ recorded a maximum plant height of 66.50 cm which was on par with ‘Phule Ganesh White’ (65.75 cm). The lowest plant height was observed in ‘Local’ (43.14 cm). The cultivar ‘Phule Ganesh Violet’ produced maximum number of primary and secondary branches per plant (21.40 and 32.80 respectively). The cv. ‘Local’ produced lowest number of primary branches (15.93) per plant while Phule Ganesh Pink’ records the lowest secondary branches (16.80).
The cv. ‘Phule Ganesh Pink’ was first to show its visible flower bud (57.20 DAT), first flowering (66.73 DAT) and 50% flowering (85.67 DAT). The cultivar ‘Phule Ganesh White’ produced the largest flowers (7.37 cm), longest stem length (34.78 cm), maximum flower yield (23.20 t/ha) and longest shelf life (9.13 days and 4.73 days) both as cut and loose flowers respectively.

Yield of flower per plant was significantly and positively associated at both phenotypic and genotypic levels with plant height (0.723 and 0.748), plant spread (0.804 and 0.852), number of flowers per plant (0.689 and 0.705), flower diameter (0.790 and 0.823), stalk length (0.681 and 0.696) and vase life both as cut flower (0.716 and 0.759) and loose flower (0.880 and 0.920).

3) “Studies on effect of different fertigation levels on growth, yield and floral preservatives on vase life of gerbera cultivars grown under polyhouse conditions”- Zehra Salma.

ABSTRACT

A field experiment, “Studies on effect of different fertigation levels on growth, yield and floral preservatives on vase life of gerbera cultivars grown under polyhouse conditions” was conducted at Agricultural Research Station, College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2008-09.

The experiment was carried out with various fertigation treatments comprising of water soluble fertilizers (WSF) and straight fertilizers (SF) each at three levels 100%, 80%, 60% of RDF (NPK @ 20:20:20 g/m²/month at vegetative stage and 15:10:30 g/m²/month at reproductive stage) with two gerbera cultivars V₁- Amelia and V₂- Galelio totally comprising of twelve treatments. The treatments were laid in factorial randomized block design and replicated thrice. Further, a second experiment was conducted with the cut gerbera flowers harvested from each of the fertigation experimental plots (Experiment1) and were kept for post harvest studies using 3 floral preservatives viz., control (distilled water), 4% sucrose + 300ppm Al₂(SO₄)₃ and 4% sucrose +50ppm Dichlorophen comprising of thirty six treatments. The treatments were laid out in factorial completely randomized design.

The results enumerated from the first experiment revealed that among the different fertigation treatments, growth parameters viz., plant height (50.43cm), number of leaves(24.12), leaf area (5334.72 cm²) were highest with 100% WSF treatment and was on a par with 100% SF. Among the cultivars, cv.Amelia proved to be superior in the above parameters tested. But the interaction effect of fertigation with cultivars was found to be non significant. Further in the studies enumerated for quality parameters, it was observed that fertigation with 100% WSF showed earlier bud opening (9.67 days), longer stalk length (60.33 cm), longer ray floret length (4.45 cm), maximum stalk diameter (0.76 cm), flower diameter (10.48 cm) and disc diameter (2.58 cm). This treatment was on a par with 100 % SF. Among the cultivars, quality parameters viz., stalk diameter (0.70 cm) and disc diameter (2.40 cm) were significantly maximum in cv. Galelio while, cv. Amelia was found superior in stalk length (54.40 cm) and ray floret length (3.72 cm). No significant effect of cultivars was observed on days to bud opening and flower diameter parameters.

Regarding yield parameters, flower yield per plant (5.13) and flower yield per square meter per month (36.15) recorded highest with 100% WSF fertigation treatment and was on a par with 100% SF. Among the cultivars, Cv. Amelia recorded highest flower yield per plant (3.88). But, flower yield per square meter in a month was not significantly influenced by the cultivars. With regard to interaction effects of fertigation with cultivars, flower yield per plant was highest in 100% WSF and 100% SF with cv. Amelia. However, quality parameters and
flower yield per square meter per month was not significantly influenced by the interaction effect of fertigation levels with cultivars.

For the investigation to the post harvest studies, vase life and water uptake recorded was highest with 100% WSF (10.61 days, 49.94 ml respectively) and was on a par with 80% WSF and 100% SF. Minimum stalk bending recorded in 80% WSF and 80% SF. No effect of cultivars was observed on vase life. But cv. Amelia recorded highest water uptake (45.37 ml) and cv. Galelio recorded minimum stalk bending. Comparatively, floral preservative containing 4% sucrose + 300 ppm Al$_2$(SO$_4$)$_3$ recorded highest vase life (9.50 days), minimum stalk bending and maximum water uptake (46.53 ml) over the rest of the treatments.

Interaction effect of fertigation levels and cultivars showed highest vase life (10.78 days) and water uptake (56.33 ml) with 100% WSF in cv. Amelia and was on a par with 80% WSF and 100% SF in both the cultivars. Whereas, interaction effect of fertigation with floral preservatives revealed that treatment combination of 100% WSF, 80% WSF and 100% SF with 4% sucrose + 300 ppm Al$_2$(SO$_4$)$_3$ recorded highest vase life. Water uptake was highest in 80% WSF with 4% sucrose + 300 ppm Al$_2$(SO$_4$)$_3$ (57.33 ml). However, interaction of cultivars with floral preservatives was non significant on vase life (mean days) and water uptake (ml).

4) “Effect of integrated nutrient management on growth, flowering, corm and cormel production in gladiolus (Gladiolus grandiflorus L.)” - P. Maya Madhavan.

**ABSTRACT**

A field experiment, “Effect of integrated nutrient management on the growth, flowering, corm and cormel production in gladiolus (Gladiolus grandiflorus L.)” was conducted at AICRP on floriculture, Agriculture Research Institute, College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2008-09. The experiment was laid out in Randomized Block Design with nine treatments consisting of T$_1$-100% recommended dose of inorganic fertilizers (RDF) 100:60:60 kg of N P K ha$^{-1}$, T$_2$-75% RDF + FYM (10 t ha$^{-1}$) + Vermicompost (3 t ha$^{-1}$), T$_3$-75% RDF + FYM (10 t ha$^{-1}$) + Vermicompost (3 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$), T$_4$-75% RDF + Neem cake (2 t ha$^{-1}$), T$_5$-50% RDF + Neem cake (4 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$), T$_6$-50% RDF + Neem cake (4 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$) replicated thrice.

The results of the experiment revealed that among the different treatments, plant height (60.74 cm), number of leaves per plant (8.20), leaf area (687.30 cm$^2$) and dry matter accumulation at harvest (27.24 g plant$^{-1}$) were the highest with the application of T$_3$ comprising of 75% RDF + FYM (10 t ha$^{-1}$) + Vermicompost (3 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$). Further, it was observed that application of 75% RDF + FYM (10 t ha$^{-1}$) + Vermicompost (3 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$) resulted in early flowering (56.53 days), 50% flowering (67.58 days), increased spike length (78.84 cm), maximum number of florets per spike (16.73), maximum corm diameter (4.98 cm), fresh weight of corms (37.79 g) and cormels (7.30 g). No significant effect of the treatments was observed on the floret size.

Non significant difference were observed for the characters like yield of spikes hectare$^{-1}$ and yield of corms hectare$^{-1}$ however, yield of spikes hectare$^{-1}$ (248000), yield of corms hectare$^{-1}$ (250000) were highest with T$_3$ treatment, 75% RDF + FYM (10 t ha$^{-1}$) + Vermicompost (3 t ha$^{-1}$) + Azospirillum (5 kg ha$^{-1}$) + PSB (5 kg ha$^{-1}$). No significant effect of
the treatments was observed on the post harvest parameters such as vase life and durability of basal floret

The highest uptake of nutrients such as N (0.904 g/plant), P (0.114 g/plant) and K (1.022 g/plant) were recorded in T3 treatment comprising 75% RDF + FYM (10 t ha⁻¹) + Vermicompost (3 t ha⁻¹) + Azospirillum (5 kg ha⁻¹) + PSB (5 kg ha⁻¹) followed by 75% RDF + FYM (10 t ha⁻¹) + Vermicompost (3 t ha⁻¹).

Economics of production revealed that the higher net returns (Rs.990165 ha⁻¹) were obtained in T3 treatment, 75% RDF + FYM (10 t ha⁻¹) + Vermicompost (3 t ha⁻¹) + Azospirillum (5 kg ha⁻¹) + PSB (5 kg ha⁻¹). Highest benefit cost ratio (1.49) was obtained with 75% RDF + FYM (10 t ha⁻¹) + Vermicompost (3 t ha⁻¹) + Azospirillum (5 kg ha⁻¹) + PSB (5 kg ha⁻¹).

5) “Influence of dates of planting on growth, yield, biochemical changes and post harvest keeping quality in different gladiolus (Gladiolus grandiflorus L.) Varieties” - U.Pavani.

ABSTRACT

A field experiment, “Influence of dates of planting on growth, yield, biochemical changes and post harvest keeping quality in different gladiolus (Gladiolus grandiflorus L.) varieties” was conducted at College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2008-09. The first experiment was laid out in Split plot design comprising sixteen treatments, with main treatment as varieties consisting of four varieties – Advance, Spic and span, White knight and Peter pears; sub-treatments as dates of planting consisting of four dates of planting- 15th September, 15th October, 15th November and 15th December. In the subsequent experiment spikes obtained from the first experiment were used for vase life studies using distilled water as control (T0), sucrose 4% + Aluminium sulphate 300ppm (T1) and sucrose 4% + Dichlorophen 50ppm (T2). It was laid out in completely randomised design with factorial concept. The entire field and lab treatments were replicated thrice.

The results of the experiment revealed that among the cultivars, Advance recorded earliest sprouting and White knight the late sprouting. 15th September planting resulted in earliest sprouting of corms while 15th December in late sprouting. The Advance produced tallest plants with more number of leaves and leaf area among the varieties. Among the planting dates, planting on 15th September recorded highest plant height, number of leaves and leaf area. Corm weight per plant and size was highest in Advance and it was comparable with White knight. September 15th planting resulted in maximum weight and size of corms. Maximum number and weight of cormels per plant was also recorded by Advance and least by White knights. 15th September and 15th December recorded maximum and minimum number and weight of cormels respectively. Maximum dry matter accumulation was recorded at harvest with Advance and with 15th September planting.

Earliness in basal floret opening, spike initiation and 50% flowering was observed in Spic and span and in 15th September planting. Duration of flowering was maximum in White knight. Late planting increased the duration of flowering. Spike quality attributes like spike length, weight of spike, number of florets per spike and number of florets remained open at a time were also more for the Advance among the cultivars and 15th September planting among the planting dates. The same trend was recorded for biochemical changes like carbohydrate content, Nitrate reductase activity and N, P, K content.

The three factors viz., cultivars, planting dates and vase chemicals also influenced the post harvest performance of gladiolus spikes. Spike from 15th December planting have shown
better performance for all observations. Among the vase solutions, sucrose 4% + Aluminium sulphate 300ppm (T1) recorded maximum vase life of spikes.


ABSTRACT

The present investigation was undertaken to estimate the genetic divergence in tomato and to carry out yield component analysis through correlation and path analysis. Fifty five genotypes were sown in a randomized block design with two replications, during rabi 2008-2009 at Vegetable Research Station, Agriculture Research Institute, APHU, Rajendranagar, Hyderabad. The objective of the experiment was to identify divergent genotypes to use as donor parents in hybridization programmes.

The D² analysis was carried out for thirteen characters which partitioned the fifty five genotypes into twelve clusters. The maximum genetic divergence was observed between clusters IX and XII followed by between clusters V and IX. The maximum intra cluster distance was shown by cluster V. The characters viz., acidity content followed by shelf life, plant height, TSS, ascorbic acid content, average fruit weight and number of fruits per plant contributed greatly towards diversity. The clusters showed high genetic divergence that could be effectively utilized in heterosis breeding programme. If a breeding programme is used at improving nutritional characters, then cluster VII showing maximum ascorbic acid that can be utilized in breeding programme. Therefore, a plant breeder may keep in mind the above aspects to obtain superior hybrids and good recombinants.

The analysis of variance revealed significant difference for thirteen characters studied suggesting considerable amount of variability exists among the genotypes. Wide range of variability was observed for plant height, number of flower clusters per plant, number of fruits per plant, average fruit weight, ascorbic acid and fruit yield per plant indicating the scope for selection of suitable initial breeding material for further improvement.

GA as percent of mean, GCV and PCV values are on par with each other for most of the characters that the influence of the environment on the trait(s) was very very negligible. The values observed are not confounding with the environment. It is a true to the reflection of the homeostasis effect or buffer reaction of the gene. Thus, the true reflection of the trait is exhibited.

In a true agreement with the GCV and PCV values in the present investigation for the 12 characters was noticed, indicating additive genetic variance governing the high heritability with genetic advance as percent of mean. Thus a breeder can employ a simple selection process which will be a rewarding one to improve the characters viz., plant height, number of primary branches per plant, number of flowers per cluster, number of fruits per plant, number of flower clusters per plant, average fruit weight, number of locules per fruit, acidity, total soluble solids, ascorbic acid, shelf life and fruit yield per plant. For days to 50 per cent flowering, high heritability with low GA as per cent of mean indicates non additive action controlling the traits. Thus, selection for days to 50 per cent flowering may not be rewarding.

From correlation studies it was observed that fruit yield per plant has exhibited highly significant positive association with average fruit weight and shelf life. Path analysis revealed that maximum positive direct effect on fruit yield per plant was exhibited by average fruit weight followed by number of fruits per plant. Therefore, it is emphasized to lay attention on
these traits like average fruit weight, number of fruits per plant and shelf life in crop improvement programme of tomato in future.

On the basis of the mean performance of the genotypes among traits studied, the following were identified as promising lines for further crop improvement in tomato viz., EC-163611, EC-257580, EC-162508, EC-165749, EC-157568, EC-145622, EC-164863, EC-177393, LE-54, LE-55, LE-59, LE-60, LE-61, LE-63, LE-65 and LE-67.

7) Studies on the effect of integrated nutrient management on growth, yield and vase life of china aster (*Callistephus chinensis* L. Nees) - K. Swathi

**ABSTRACT**

A field experiment, “Studies on the effect of integrated nutrient management on growth, yield and vase life of china aster (*Callistephus chinensis* L. Nees)” was conducted at All India Coordinated Research Project on Floriculture, Agricultural Research Institute, Andhra Pradesh Horticultural University, Rajendranagar, Hyderabad during the year 2008-09.

The experiment was carried out with eleven treatments comprising of inorganic fertilizers, organic manures such as vermicompost, neem cake and biofertilizers (*Azospirillum* and Phosphate Solubilizing Bacteria). The treatments were laid in Randomized Block Design and replicated thrice.

The results of the experiment revealed that among the different treatments, growth parameters viz., plant height (60.87 cm), number of branches per plant (22.50), plant spread (27.17 cm), leaf area (586.41 cm²), and total dry matter production (44.57 g) were highest with the combined application of 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each at 5 kg ha⁻¹ along with 75 per cent Recommended Dose of Fertilizers (RDF).

Further in the studies enumerated for floral characters, it was observed that application of 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each at 5 kg ha⁻¹ along with 75 per cent Recommended Dose of Fertilizers (RDF) showed early flower bud initiation (60.96 DAT), 50 per cent flowering (80.02 DAT), early flower opening (69.12 DAT), maximum stalk length (29.77 cm), maximum flower diameter (6.57 cm) and maximum vase life (8.23 days).

Regarding yield parameters, maximum number of flowers per plant (48.72), flower yield per plant (128.59 g) and flower yield per hectare (11.74 t ha⁻¹) were achieved by the application of 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each at 5 kg ha⁻¹ along with 75 per cent Recommended Dose of Fertilizers (RDF).

Plants receiving 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each at 5 kg ha⁻¹ along with 75 per cent Recommended Dose of Fertilizers (RDF) recorded significantly higher uptake of nutrients (N -186.03 kg ha⁻¹, P-26.71 kg ha⁻¹, K-103.87 kg ha⁻¹). Similarly, significantly higher available nutrients in soil such as nitrogen (326.48 kg ha⁻¹), phosphorus (59.93 kg ha⁻¹) and potassium (300.90 kg ha⁻¹) were recorded in the same treatment consisting of 75 per cent Recommended Dose of Fertilizers (RDF), 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each at 5 kg ha⁻¹.

The economic results clearly indicated that net returns per hectare and benefit-cost ratio was highest in the plots treated with 5 t ha⁻¹ vermicompost, PSB and *Azospirillum* each @ 5 kg ha⁻¹ along with 75 per cent Recommended Dose of Fertilizers (RDF) and this finding can be used in making china aster production more profitable.
ABSTRACT

A field experiment was conducted from December 2008 to September 2009 at Model Orchard, College of Horticulture, Rajendranagar, Hyderabad to study the Effect of plant growth regulators on yield and quality of pomegranate (Punica granatum L.) cv. Ganesh. The experiment was laid out in a Randomized Block Design. The treatments consisted of three levels of NAA (20, 30 and 40 ppm), three levels of 2, 4-D (20, 30 and 40 ppm) and three levels of GA$_3$ (25, 50 and 75 ppm) and one control. Altogether there were ten treatments and were replicated thrice. The growth regulators were applied thrice i.e., first spray was given at the time of flowering and again at 45 and 90 days after fruit set. Observations on fruit length, fruit diameter, fruit volume, fruit weight, aril weight, aril percentage, number of arils per fruit, number of fruits per tree and yield were recorded. Chemical analysis was done to determine quality parameters of the fruit.

2, 4-D was proved to be the most effective in increasing fruit size in terms of fruit length, diameter, volume and fruit weight and the best results were obtained with 2, 4-D 40 ppm followed by GA$_3$ 75 ppm. NAA also improved the size but less effective than the other two growth regulators. Aril weight, aril percentage and number of arils per fruit were also increased with all the growth regulator treatments. The best results were obtained with 2, 4-D 40 ppm followed by GA$_3$ 75 ppm, 2, 4-D 30 ppm and NAA 40 ppm. All the three growth regulators increased the aril percentage significantly over the control but the increase was in association with the increased concentration of the growth regulators.

The number of fruits per tree was increased significantly with all the treatments over control and the best results were obtained with 2, 4-D 40 ppm followed by NAA 40 ppm and NAA 30 ppm. The yield per tree was also increased with all the treatments but, best results were obtained by 2, 4-D 40 ppm followed by GA$_3$ 75 ppm, NAA 40 ppm and 2, 4-D 30 ppm.

Juice content, TSS and total sugars content were increased markedly with 2, 4-D and GA$_3$ treatments, best results were obtained with higher concentrations. Similarly titratable acidity was also reduced significantly over control with GA$_3$, 2, 4-D and NAA at higher concentrations.

Maximum net returns were obtained with 2, 4-D 40 ppm followed by NAA 40 ppm and the lowest with control. The decrease in the net returns in case of GA$_3$ may be due to the higher cost than the other two growth regulators. 2, 4-D 40 ppm recorded highest benefit cost ratio followed by NAA 40 ppm and the lowest with control. GA$_3$ gave good returns but recorded lesser benefit cost ratio than the other two growth regulators due to its higher cost.

From the present study it was concluded that 2, 4-D 40 ppm could be used under the agro-climatic conditions of Hyderabad to increase yields and improve quality of pomegranate fruits. The next better treatment to 2, 4-D was GA$_3$ 75 ppm to increase yields and improve quality. In economic point of view also 2, 4-D was superior to NAA and GA$_3$ because of its higher net returns and lower cost when compared with other two growth regulators.
9) “Processing of pomegranate (cv.bhagwa) fruits for value addition”- P.Chandana

ABSTRACT

Pomegranate is one of the most favourite table fruits grown in India. It was not given due importance for preparing value added products. Blending is a convenient alternative to have value added fruit drinks which are of high quality in respect of sensory and nutritional aspects. The present study was conducted for the preparation of fruit juice RTS blended with the combination of pineapple, guava and grape. Arils are highly perishable and have a shelf life of less than 24 hours. Hence, the low temperature storage in combination with Radiation Processing is taken up to prolong their shelf life.

Initially nine blends of pomegranate with pineapple, guava and grape were prepared in addition to RTS beverage. Based on organoleptical scores three blends were selected and storage studies were conducted. The products were analyzed at every 15 days interval for their physicochemical, organoleptic characteristics and microbial load.

The increase in TSS, pH, Total sugars was observed in all the blends at ambient and low temperature. Ascorbic acid and titrable acidity decreased in blends and RTS at both ambient and low temperatures. The RTS stored well up to 60 days at ambient and 90 days at low temperature. Increase in microbial load with the storage was observed in all the RTS beverages. The overall results indicated that RTS beverages can be stored up to 3 months at low temperature and 2 months at ambient temperature.

In case of radiation processed arils the TSS initially increased up to 6 days and thereafter declined. There was a decline in ascorbic acid content, titrable acidity and total sugars during storage. The antioxidant activity decreased with increase in radiation dose and storage period. The microbial growth appeared from 6th day of storage in all the arils except those irradiated at 4kGy. Irradiation at 2kGy and storage at 5°C was found to be good compared to other treatments in terms of quality. The overall acceptability of processed arils decreased with increase in storage period.

10) Evaluation of grape (Vitis vinifera L) Varieties for raisin making”- K.Gopi Kumar

ABSTRACT

The present investigation was conducted in two experiments i.e. by shade drying and cabinet drying methods at Grape research station, APHU, Hyderabad. The experimentation was replicated thrice in factorial completely randomized design to find out the raisin making quality of six grape varieties viz., Thompson Seedless, 2A-Clone, Manik Chaman, Tas-A-Ganesh, Arkavati and Merbein Seedless. The grapes were subjected to pre-drying treatments viz., Golden bleach hot dip method, Golden bleach cold dip method, Soda oil dip method and Dipping oil method. The treated grapes were dried separately under shade drying in a well ventilated room and cabinet drying at constant temperature of 45°C. Shade drying method took 14.08 to 19.08 days (338 to 458 hr) and cabinet method took 2.54 to 4.04 days (61 to 97 hr) for specified level of moisture. Time saving in cabinet drying was 81 percent over shade drying. The grapes dried early in cultivar Merbein Seedless with golden bleach methods and took maximum time in Tas-A-Ganesh with oil emulsion methods. The raisins prepared by these two drying methods were estimated for moisture content and recovery of raisins and stored for three months at room temperature in loose packing with 400 gauge polythene bags. Merbein Seedless treated with dipping oil method in shade drying (25.48 %) and in cabinet drying (26.15 %) and Thompson Seedless treated with golden bleach hot dip method in shade (25.81 %) and cabinet (24.49 %) drying had recorded highest raisin recovery.
The stored raisins were then analyzed for their chemical quality properties. The raisin moisture was high in Tas-A-Ganesh in shade and cabinet dryings. Minimum moisture was found in Manik Chaman followed by Merbein Seedless. In both the drying methods, the small sized raisin with minimum weight was found in Merbein Seedless (0.39 g) and Manik Chaman (0.41 g) and highest raisin weight was obtained in Thompson Seedless (0.48 g). Acidity content of raisins was less in Merbein Seedless with golden bleach cold dip method and more in Arkavati and Manik Chaman with golden bleach hot dip method in both dryings.

Total soluble solids in raisins of Merbein Seedless and Thompson Seedless with golden bleach methods were found superior in two drying methods. Minimum TSS was found in Arkavati. The total sugars were found maximum in Merbein Seedless and Thompson Seedless. Minimum total sugars were found in Manik Chaman of golden bleach hot dip method. The reducing sugars found high in Merbein Seedless and low in Tas-A-Ganesh. The treatments golden bleach methods had high reducing sugars than oil emulsion methods. Non-reducing sugars content was found high in the cultivars Merbein Seedless and Thompson Seedless.

In golden bleach methods, the \( \text{SO}_2 \) was high in raisins of Merbein Seedless, Manik Chaman and in Thompson Seedless. Low amount of \( \text{SO}_2 \) was found in Arkavati in both the drying methods. In two drying methods, the treatment golden bleach hot dip method (114.49 ppm) was superior to golden bleach cold dip method (101.69 ppm) in \( \text{SO}_2 \) content. The non-enzymatic browning was minimum in cultivars Manik Chaman, Merbein Seedless and Thompson Seedless raisins. The treatment, golden bleach hot dip method in shade and cabinet dryings effectively inhibited raisin browning and had low NEB values.

The cultivar Manik Chaman has obtained high organoleptic score and had brighter colour and appearance followed by Merbein Seedless, 2A-Clone and Thompson Seedless. Manik Chaman was found given acceptable green colour with soda oil dip treatment. The varieties, Manik Chaman, Merbein Seedless and Thompson Seedless had given good textured raisins in both drying methods. The taste of raisins was scored to good in Manik Chaman, Thompson Seedless, Merbein Seedless and 2A-Clone. All the raisins had an equivalent flavour irrespective of browning and drying methods. High overall acceptance was acquired by Manik Chaman, Thompson Seedless and Merbein Seedless. The variety Arkavati was least accepted.

The results revealed that Merbein Seedless is superior for raisin making followed by Manik Chaman and Thompson Seedless with their rich contribution of high raisin recovery, small sized raisins, bright colour and excellent raisin qualities. Golden bleach hot dip method was effective in obtaining high quality and organoleptic acceptability of raisins better than Golden bleach cold dip method and other treatments. Manik Chaman with soda oil dip method has acquired green coloured flavorsome raisins. In rate of drying grapes, the cabinet drying is superior to shade drying, but there is no difference in physico-chemical qualities of raisins between two drying methods.

11) “Studies on the effect of chemicals and plant growth regulators on dormancy, growth, flowering, corm and cormel production in gladiolus (Gladiolus grandiflorus L.)” - K.Suresh Kumar

**ABSTRACT**

The present investigations entitled “STUDIES ON THE EFFECT OF CHEMICALS AND PLANT GROWTH REGULATORS ON DORMANCY, GROWTH, FLOWERING, CORM AND CORMEL PRODUCTION IN GLADIOLUS (Gladiolus grandiflorus L.)” were carried out during 2008-2009 in herbal garden at College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad.

For this study, two experiments were conducted, with the corms of Gladiolus cultivars American Beauty and White Prosperity. There are 20 treatments each replicated thrice in

Cultivar American Beauty in combination with GA$_3$ at 125 ppm recorded less number of days to sprout (17.00) and 50 percent sprouting (29.00) of gladiolus corms. In all the plant growth regulator treatments, minimum number of days to sprouting and 50 percent sprouting of corms were observed with higher concentrations. GA$_3$ at 125 ppm recorded highest percentage of sprouting (100.00) in both the cultivars. Cultivar American Beauty in combination with BA at 100 ppm recorded highest number of sprouts per corm.

Cultivar White Prosperity had maximum vegetative growth over cv. American beauty. Cultivar White Prosperity in combination with GA$_3$ at 125 ppm recorded maximum values for plant height, number of leaves, leaf length, leaf width and leaf area over cv. American Beauty. Among all the plant growth regulator treatments, higher concentrations had shown promotory effect on vegetative characters in both the cultivars.

Among the Plant growth regulator treatments, cv. American Beauty in combination with NAA at 150 ppm recorded minimum number of days to first floret appearance (70.00), 50 percent flowering (80.67) and number of days to first flower spike harvest (75.33). BA at 100 ppm recorded maximum number of spikes per corm in cv. American Beauty (1.67). Cultivar White Prosperity in combination with GA$_3$ at 125 ppm recorded significantly higher mean spike length (65.00 cm) as well as maximum number of florets per spike (11.33).

The plant growth regulator treatment BA at 100 ppm recorded maximum number of replacement corms (1.28) and number of cormels produced per corm (5.29) with cv. American Beauty where as cv. White Prosperity with BA at 100 ppm recorded maximum cormel weight per corm (8.02 g) and highest propagation coefficient (193.68). NAA at 150 ppm recorded maximum corm size (4.66 cm) and corm weight (23.15 g) in cv. White Prosperity

In second experiment, the chemical treatment Salicylic acid (SA) at 150 ppm recorded minimum values for number of days for sprouting of corms (16.16), days to 50 percent sprouting of corms (26.33) and maximum number of sprouts per corm with cv. American beauty. Among the chemical treatments studied, Potassium nitrate at 1.5 % recorded highest percentage of sprouting in both the cultivars.

Cultivar White Prosperity recorded maximum values for vegetative growth parameters over cv. American beauty. Among the chemical treatments studied, Salicylic acid and Potassium nitrate at higher concentrations recorded higher values for plant height, number of leaves, leaf length, leaf width and leaf area.

Among the chemical treatments, minimum number of days to first floret appearance (70.00), 50 percent flowering (79.00), maximum number of spikes per corm (1.33) and minimum number of days to first harvest of gladiolus spikes(74.00) was with Salicylic acid at 150 ppm in cv. American beauty. The cultivar White Prosperity with Salicylic acid at 150 ppm recorded highest mean spike length (65.00 cm) and maximum number of florets per spike (10.93) followed by Potassium nitrate at 1.5%.

The cultivar American beauty, with chemical treatment Potassium nitrate at 1.5 % recorded highest number of replacement corms per corm (1.45), however with Salicylic acid at 150 ppm it recorded maximum number of cormels per corm (4.72). Among the chemical treatments, cultivar White Prosperity in combination with Salicylic acid at 150 ppm recorded maximum corm size (4.41 cm), maximum corm weight (21.56 g), maximum cormel weight produced per corm (6.59 g) and highest propagation coefficient (184.72).
**ABSTRACT**

A set of four experiments were conducted in the Post Harvest Technology Laboratory, College of Horticulture, Rajendranagar, Hyderabad from November 2008 to January 2009. Investigations were carried out to understand the Effect of various post harvest treatments like Gamma irradiation and Antioxidants on shelf life of guava cv. Allahabad Safeda by exposing the fruits to irradiation of different doses and treating the fruits with antioxidants at both ambient and low temperature conditions.

All the experiments were carried out in CRD with factorial concept and the treatments were replicated thrice. Physico-chemical characters were recorded at 3 days intervals to study the shelf life of guava fruit under ambient conditions with different irradiation doses. Further the synergy of antioxidants & irradiation doses in enhancing the shelf life of guava fruit both at ambient and low temperature conditions was also studied.

It was observed that the physiological loss in weight, colour index, spoilage rates increased and fruit firmness decreased in all the experiments irrespective of the treatments with the advancement of duration. Total Soluble Solids, brix acid ratio, reducing sugars and total sugars increased initially and then decreased towards the end of the storage period.

In the first experiment, the fruits were exposed to irradiation doses of 0.20 kGy, 0.40 kGy, 0.60 kGy, 0.80 kGy and 1.0 kGy with the help of gamma chamber 5000. Among these treatments, lower doses at 0.20 kGy followed by 0.40 kGy recorded lower physiological loss in weight, colour development, spoilage, acidity and higher firmness, Total Soluble Solids, ascorbic acid, brix acid ratio, reducing sugars, total sugars and thereby recorded more shelf life (11.33 and 10.33 days) over control. Antioxidant activity decreased with the increase in irradiation dose and storage period. Control recorded higher antioxidant activity and was followed by 0.20 kGy. With increase in doses of irradiation titrable acidity increased, whereas Total soluble solids, ascorbic acid, brix acid ratio, reducing sugars and total sugars decreased. Total soluble solids, brix acid ratio, reducing sugars and total sugars increased initially and decreased towards the end of the storage period.

In the second experiment, the fruits were treated with antioxidants ascorbic acid (500&1000ppm), benzyl adenine (50&100 ppm) and sodium benzoate (500&1000ppm). Among antioxidants, BA 100 ppm followed by BA 50 ppm recorded lower physiological loss in weight, colour index, spoilage, acidity and higher firmness, Total Soluble Solids, ascorbic acid, brix acid ratio, reducing sugars, total sugars and thereby increased shelf life (11 days) of guava and proved to be the best antioxidant treatments.

The best two treatments from the experiment I (0.20 & 0.40 kGy) and experiment II (BA 50 & 100 ppm) were combined to study their synergy at ambient temperature and 10°C in the third and fourth experiments respectively. The combination treatment of benzyl adenine 100 ppm+0.20 kGy increased the shelf life upto 13 days compared to control (5.33 days) at ambient temperature and 28 days compared to control (20.33 days) at 10°C. In all the combination treatments of benzyl adenine(50&100 ppm)+ irradiation dose(0.20&0.40 kGy), fruit firmness, total soluble solids, ascorbic acid, brix acid ratio, reducing sugars and total sugars were found to be higher when compared to control both at ambient and 10°C storage conditions.
**13) “Development of rapid regeneration protocol in brinjal (Solanum melongena L.)” - Vivek Hegde**

**ABSTRACT**

Brinjal is one of the most important vegetable crops in India as well as in tropical countries of the world. In the present study, the rapid regeneration protocol of brinjal was conducted. In which the hypocotyl and shoot tip explants from the in vitro grown sterile seedling were used to obtain callus and adventitious buds. The MS culture medium with BAP at 2.5 mg/l + IAA at 0.3 mg/l induced highest callus growth in hypocotyl (1.43 cm) as well as in shoot tip (1.14 cm) and also highest shoot regeneration was observed in both the explants from shoot tip (2.13) and hypocotyl (1.88). The highest shoot length (1.67 cm) and also more number of leaves (2.83) recorded in shoot tips cultured in the MS medium containing same concentration of BAP and IAA i.e. 2.5 mg/l and 0.3 mg/l respectively after 28 days of culture period.

The callus obtained from both the explants (shoot tip and hypocotyl) were sub-cultured on responding treatments i.e. MS medium containing BAP at 2.5 mg/l + IAA at 0.2 mg/l and BAP at 2.5 mg/l + IAA at 0.3 mg/l. After sub-culturing, the highest number of shoots (3.59), shoot length (3.16 cm) and more number of leaves (3.66) were recorded on the medium containing BAP at 2.5 mg/l + IAA at 0.3 mg/l after 28 days of culture period.

Root induction frequency was highest in full strength MS medium with IAA at 0.5 mg/l. The full strength MS medium supplemented with IAA at 0.5 mg/l recorded more number of roots (14.06), root length (6.99 cm), as well as more number of leaves (6.27).

Hardening of rooted plantlets were carried out initially (14 days) under lab condition in plastic cups containing different potting mixtures (substrates). The highest survival percentage (100 per cent), shoot length (7.23 cm) and more number of leaves (6.52) were observed in cups filled with cocopeat, FYM and vermiculite in 1:1:1 ratio. The development of rapid regeneration protocol in brinjal reported here that took less time, i.e. 3 to 4 months from initiation to establishment. The acclimatized plantlets were planted under shade house after 28 days of hardening. They have reached to mature stage and fruits have been harvested and was also observed that all plants were morphologically similar.

**14) “Genetic diversity and character association in brinjal (Solanum melongena L)” - B.Lokesh**

**ABSTRACT**

A set of sixty germplasm accessions of brinjal (Solanum melongena L.) were evaluated in a Randomized Block Design with two replications at Vegetable Research Station, ARI, Rajendranagar during rabi 2008-09 to study genetic diversity, variability, heritability, genetic advance, character association and direct and indirect effects on yield. Each germplasm line was grown in a single row plot of 4.5 m length at spacing of 60 x 45 cm. The data were recorded on five randomly selected plants for plant height, plant spread, number of branches per plant, days to 50% flowering, number of flower clusters per plant, number of flowers per cluster, number of fruits per cluster, fruit length, fruit diameter, fruit weight, while on whole plant basis for number of fruits per plant, shoot and fruit borer incidence and fruit yield per plant. The mean biometric data were analysed following the standard statistical procedures.

Multivariate analysis following mahalanobis $D^2$ statistics revealed that the entire germplasm were grouped into 8 distinct clusters. The intercluster distance was maximum between cluster III and VIII indicating that the genotypes of these clusters are highly divergent. Fruit weight and plant spread had more contribution to total divergence. Hence selection of one
or two genotypes from cluster III and VIII based on fruit weight and plant spread and crossing would result in high heterosis and throw useful transgressive segregants.

The analysis of variance of RBD revealed highly significant differences among the genotypes for all the 14 characters studied. The values of PCV and GCV for plant height, plant spread, number of branches per plant, number of fruits per cluster, fruit diameter, fruit weight, shoot and fruit borer incidence on shoot and fruit and fruit yield per plant were high indicating that the variability observed in 60 genotypes was high.

High heritability coupled with high genetic advance for plant height, plant spread, fruit weight, shoot and fruit borer incidence on shoot indicated the involvement of additive gene action and thus the chances of fixing by selection are more to improve such traits through pureline selection, mass selection, progeny selection and hybridization and selection with pedigree breeding.

Correlation coefficient analysis revealed highly significant positive association of number of flowers per cluster, number of fruits per cluster, fruit weight, number of fruits per plant and negative association of shoot and fruit borer incidence on fruit with fruit yield per plant and thus these characters were identified as component characters on which selection can be relied upon for genetic improvement of brinjal.

Path coefficient analysis revealed that fruit weight and number of fruits per plant had high positive direct effect on fruit yield per plant, while the remaining characters had negligible to low indirect effect through other component characters. Therefore fruit weight and number of fruits per plant are the reliable characters for the improvement of fruit yield. The residual effect of 0.1063 is low since all the 14 characters contributed 89.37% to total variation in yield. It indicated that some other possible characters which have not been studied here need to be included in this analysis to account fully for the variation in fruit yield of brinjal.

The mean performance of genotypes indicated that the genotypes IC-99649, IC-90930, IC-345309, IC-089905 and MR/04-26 were found to be elite for tallness, earliness, prolificity, less incidence of shoot and fruit borer and fruit yield per plant respectively. The elite genotypes from different clusters may be chosen for further breeding programme. Further one or two elite genotypes from different clusters may be chosen for further genetic studies either by way of diallel or Line X Tester analysis.

15) “Studies on fermentation of custard apple pulp with Saccharomyces cerevisiae var. ellipsoideus at different dilutions for wine preparation” - Vikas Kumar

ABSTRACT

An experiment entitled “Studies on Fermentation of Custard apple Pulp with Saccharomyces cerevisiae var. ellipsoideus at Different Dilutions for Wine Preparation” was conducted at College of Horticulture, Rajendranagar, Hyderabad from November 2009 to February 2010. It consisted of six treatments where in custard apple pulp was diluted to 1 : 2, 1 : 3 and 1 : 4 dilutions with and without 0.1% DAHP. It replicated thrice with Completely Randomized Design with factorial concept.

The objective of experiment was to standardise the dilution of Custard apple pulp for wine preparation, to study the effect of DAHP on the rate of fermentation and to study the compositional changes of must during fermentation and aging of wine. The fermentation of must was completed on 12th day in 1 : 2 and 1 : 3 dilution with DAHP. The treatment 1 : 4 dilution with DAHP recorded higher alcohol production (8.14%) during the fermentation.

The treatments 1 : 4 dilution with DAHP recorded low of reducing sugars(1.91%), total sugars (5.53%), less of titrable acidity (0.56%), minimum of phenols (231.66 µg/ml) and lower pH (3.72) during fermentation.
During aging there was decrease in alcohol content (10.96% to 10.72%) because of auto-oxidation of ethyl alcohol to aldehydes and/or combination with volatile acids to form esters. The other compositional changes like decrease of TSS, reducing sugars, total sugars, titrable acidity, phenols and tannins was noticed.

The overall acceptability of wine was recorded maximum with 1 : 4 dilution with DAHP scoring to a scale of good. On comparison of custard apple wine with that of standard (grape) wine, it recorded to a scale of “good” as against a scale of “excellent” for standard (grape) wine. The calculated cost of custard apple wine was about Rs. 21.00 for 200ml of bottle.

16) “Studies on integrated nutrient management on growth, flowering and seed yield of african marigold (*Tagetes erecta* L.)” - Omi Tayeng

**ABSTRACT**

A field experiment, “Studies on integrated nutrient management on growth, flowering and seed yield of African marigold (*Tagetes erecta* L.)” was conducted at All India Coordinated Research Project on Floriculture, Agricultural Research Institute, College of Horticulture, Andhra Pradesh Horticultural University, Rajendranagar, Hyderabad during the year 2008-09. The experiment was laid out in Randomized Block Design with eleven treatments and replicated thrice.

The treatments consist of 100% recommended dose of inorganic fertilizers (RDF) 120:90:100 kg of N P K ha\(^{-1}\) (T\(_1\)), 100% FYM (25 t ha\(^{-1}\)) (T\(_2\)), Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_3\)), 100% RDF + 100% FYM (T\(_4\)), 75% RDF + 75% FYM (T\(_5\)), 50% RDF + 50% FYM (T\(_6\)), 100% RDF + Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_7\)), 100% FYM + Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_8\)), 100% RDF + 100% FYM + Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_9\)), 75% RDF + 75% FYM + Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_{10}\)) and 50% RDF + 50% FYM + Biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) (T\(_{11}\)).

The results of the experiment revealed that among the different treatments, maximum growth attributes viz., plant height (100.66 cm), stem girth (5.62 cm), number of branches plant\(^{-1}\) (22.89), plant spread (72.93 cm), and total dry matter production at harvest (83.89 g plant\(^{-1}\)) was recorded in T\(_9\) treatment comprising of 100% RDF (120:90:100 kg NPK ha\(^{-1}\)) + 100% FYM (25 t ha\(^{-1}\)) + biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)). Further, it was observed that the different floral attributes viz., early flower bud appearance (32.53 days), 50% flowering (58.23 days), longer duration of flowering (45.15 days) and maximum diameter of flower (7.38 cm) was recorded with the same treatment.

Among the flower yield attributes, maximum number of flowers plant\(^{-1}\) (39.47), number of flower pickings (7.95), weight of single flower (6.72 g), highest flower yield plant\(^{-1}\) (265.27 g) and flower yield ha\(^{-1}\) (14.85 t ha\(^{-1}\)) were found with treatment T\(_9\) (100% RDF + 100% FYM + biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)).

Non significant result was recorded for the vase life of flowers with the different treatment combinations. Better seed yield attributes viz., number of seeds flower\(^{-1}\) (284.85), seed yield flower\(^{-1}\) (1.37 g), seed yield plant\(^{-1}\) (25.86 g) and test weight (2.90 g) were achieved with the application of 100% RDF + 100% FYM + *Azospirillum* and PSB each @ 5 kg ha\(^{-1}\) (Treatment T\(_9\)). The highest uptake of nutrients such as nitrogen (177.78 kg ha\(^{-1}\)), phosphorus (27.38 kg ha\(^{-1}\)) and potassium (106.83 kg ha\(^{-1}\)) were recorded in treatment T\(_9\) comprising of 100% RDF + 100% FYM + biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)). Similarly, the highest available nitrogen (300.34 kg ha\(^{-1}\)), phosphorous (53.49 kg ha\(^{-1}\)) and potassium
(288.04 kg ha\(^{-1}\)) in soil was recorded by the application of 100% RDF + 100% FYM + *Azospirillum* and PSB each @ 5 kg ha\(^{-1}\)) (Treatment T\(_9\)).

The results from the present study clearly showed that the application of treatment T\(_9\) i.e., 100% RDF + 100% FYM + biofertilizers (*Azospirillum* 5 kg ha\(^{-1}\) + PSB 5 kg ha\(^{-1}\)) resulted in the maximum net returns (Rs. 95,792 ha\(^{-1}\)) with a benefit-cost ratio of 1.82.

17) “Studies on the performance of tomato (*Lycopersicon esculentum* Mill.) Hybrids under southern telangana zone of Andhra Pradesh” - Y. Mohan

**ABSTRACT**

A field experiment was conducted at the student’s farm, College of Agriculture, Rajendranagar, Hyderabad during rabi 2008, with the object of studying the performance of fourteen hybrids viz., Suruchi, US-618, JK Desi, Annapurna, Benita, Tulasi, Heemsohna, 9005-Siri, NS-585, Maruti, Jasper, Archana, Sridevi and Lakshmi in respect of growth, yield and quality characters and their suitability to this zone. The experiment was laid out in randomized block design with fourteen treatments replicated thrice.

The hybrid Heemsohna recorded the highest plant height (98.60 cm) and number of branches (15.27) followed by Maruti (91.93 cm and 14.20) significantly superior to check hybrid Lakshmi (68.60 cm and 11.87) where as JK Desi recorded the lowest plant height (56.20 cm) and number of branches (7.47).

The hybrid 9005-Siri was early flowering (35.67 days) hybrid followed by Lakshmi (36.00 days). The hybrids Maruti (38.00 days) and Tulasi (38.67 days) are intermediate. Archana and NS-585 are late (48.00 days) among the all hybrids.

The maximum number of flowers cluster\(^{-1}\) (5.93) and fruits cluster\(^{-1}\) (5.13) were recorded in JK Desi followed by check hybrid Lakshmi (5.40 and 4.93) where as it was minimum in Tulasi (4.20 and 3.60). Highest number of fruits plant\(^{-1}\) was found in Heemsohna (54.2) followed by Maruti (52.8) which was significantly superior to the check hybrid Lakshmi (49.13). The hybrid Tulasi recorded the highest yield plant\(^{-1}\) (3.98 kg) and was on par with Maruti (3.93 kg) which were statistically superior to the check hybrid Lakshmi (2.49 kg). The lowest yield plant\(^{-1}\) was recorded in JK Desi (1.95 kg).

Maximum number of locules fruit\(^{-1}\) was observed in hybrid Annapurna (5.67) followed by Suruchi (4.93) and on par with the check hybrid Lakshmi (4.87).

Longest shelf life was observed in hybrid US-618 (41.67 days) followed by Jasper (39.33 days) where as the shortest shelf life was observed in check hybrid Lakshmi (22.33 days).

The highest TSS was observed in hybrid Maruti (5.87°Brix) followed by Benita (5.50°Brix) and Tulasi (5.30°Brix) which was significantly superior over check hybrid Lakshmi (4.17°Brix). The least T.S.S was recorded in JK Desi (3.73°Brix).

The highest percentage of acidity was observed in the fruits of the hybrid JK Desi (0.41%) significantly superior over the check hybrid Lakshmi (0.36%). The lowest acidity was observed in the hybrid Annapurna (0.27%). The maximum brix/acid ratio was observed in the hybrid Maruti (20.47) followed by Annapurna (18.54) which was significantly superior over the check hybrid Lakshmi (11.57), where as it was least in JK Desi (9.12). The highest ascorbic acid content was observed in the hybrid JK Desi (31.57 mg/100g) followed by Heemsohna (27.90 mg/100g) which was on par with the check hybrid Lakshmi (27.13 mg/100g), where as lowest ascorbic acid content recorded in hybrid Maruti (17.60 mg/100g).

Hybrid Tulasi and Maruti showed better in respect of yield and quality among the hybrids studied and hence they can be recommended for cultivation under Southern Telangana zone of Andhra Pradesh during rabi season.

ABSTRACT

Studies on “Effect of plant growth regulators and spacing on growth, flower yield and carotenoid content of African marigold (Tagetes erecta L.) cv. Pusa Narangi Gainda” was conducted at Herbal garden, College of Horticulture, Rajendranagar, Hyderabad during 2008-09. The study was carried out with two experiments. Expt-I - To study the effect of two spacings 40 x 30 cm and 50 x 30 cm and also the effect of exogenously applied Plant growth retardants i.e. CCC and TIBA at concentrations of 500 ppm, 750 ppm 1000 ppm, and 1250 ppm respectively on growth, flower yield and carotenoid content in African marigold cv. Pusa Narangi Gainda with 18 treatments replicated thrice in RBD with factorial concept. Expt-II - To study the effect of two spacings 40 x 30 cm and 50 x 30 cm and also the effect of exogenously applied growth regulators i.e. GA3 and Ethrel at concentrations 100 ppm, 200 ppm 300 ppm, and 400 ppm respectively on growth, flower yield and carotenoid content in African marigold cv. Pusa Narangi Gainda with 18 treatments replicated thrice in RBD with factorial concept. Among the growth regulators studied, GA3 had promotive effect on vegetative characters like plant height and internodal length. Ethrel, TIBA, and CCC suppressed plant height, internodal length and enhanced plant spread and number of laterals. LAI recorded by Ethrel, TIBA, and CCC treatments was less than control. GA3 at 300 ppm advanced flowering, increased flower weight, flower size, flower yield and carotenoid content. Ethrel at 300 ppm increased number of flowers per plant and reduced flower size and flower weight. CCC at 500 ppm enhanced number of flowers and CCC at 750 ppm recorded maximum flower yield per plant and hectare. TIBA at 1000 ppm recorded maximum flower size, flower weight and carotenoid content in gms /Kg of petals. Ethrel at all concentrations recorded low carotenoid content in petals compared to control. Ethrel increased carotenoid yield per hectare compared to control due to increased flower yield. Among the spacings adopted, 50 x 30 cm reduced plant height, enhanced plant spread, number of branches and leaf area index and enhanced the floral characters i.e. number of flowers, flower size, flower weight and flower yield per plant and carotenoid content in petals. Spacing of 40 x 30 cm enhanced plant height, advanced flower initiation, increased flower and carotenoid yield per hectare. The treatment combination of GA3 at 300 ppm with 40 x 30 cm spacing recorded more flower yield and carotenoid yield per hectare.

19) “Effect of integrated nutrient management on growth, flowering & yield in rose (Rosa indica L.) Cv Sophia Loren” - Pratiksha Gavali

ABSTRACT

An investigation was carried out on “Effect of integrated nutrient management on growth, flowering and yield in rose (Rosa indica L.) cv. Sophia Loren” at College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2009-10. The experiment was laid out in Randomized Block Design with nine treatments replicated thrice.

The treatments consisted of 100% recommended dose of inorganic fertilizers (RDF) (500:400:300 Kg of NPK ha⁻¹) (T1), FYM 30 t ha⁻¹ + Remaining RDF through chemical fertilizers (T2), Neem cake 2 t ha⁻¹ + Remaining RDF through chemical fertilizers (T3), Vermicompost 2 t ha⁻¹ + Remaining RDF through chemical fertilizers (T4), FYM 30 t ha⁻¹ + Azotobactor 10 kg ha⁻¹ + PSB 10 kg ha⁻¹ + Remaining RDF through chemical fertilizers (T5),
Neem cake 2 t ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers (T\(_{6}\)), Vermicompost 2 t ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers (T\(_{7}\)), FYM 15 t ha\(^{-1}\) + Vermicompost 1 t ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers (T\(_{8}\)), FYM 15 t ha\(^{-1}\) + Neem cake 1 t ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers (T\(_{9}\)).

The results of the experiment revealed that among the different treatments, maximum growth attributes viz., plant height (146.56 cm), number of branches plant\(^{-1}\) (16.40), plant spread (85.83 cm), and total dry leaf biomass at harvest (4.53 g plant\(^{-1}\)) was recorded in T\(_{8}\) (FYM 15 t ha\(^{-1}\) + Vermicompost 1 t ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers) treatment. Further, it was observed that the different floral attributes viz., Bud diameter (2.57 cm), days taken to flowering (22.66), number of petals per flower (48.90) and maximum diameter of flower (10.40 cm) was recorded with the same treatment. Non significant result was recorded for the bud length of flower with the different treatment combinations.

Among the flower yield attributes, maximum number of flowers plant\(^{-1}\) (38.27), number of flower pickings (6.48), weight of single flower (14.32 g), number of flowers per m\(^2\) (103.32) flower yield ha\(^{-1}\) (10.66 lakhs) and vase life (8.96 days) were found with treatment T\(_{8}\) (FYM 15 t ha\(^{-1}\) + Vermicompost 1 to ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers). The highest nutrient content in leaves such as nitrogen (2.95%), phosphorus (0.265%) and potassium (1.61%) were recorded in treatment T\(_{8}\) comprising FYM 15 t ha\(^{-1}\) + Vermicompost 1 to ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers.

The results from the present study clearly showed that the application of T\(_{8}\) comprising FYM 15 t ha\(^{-1}\) + Vermicompost 1 to ha\(^{-1}\) + Azotobactor 10 kg ha\(^{-1}\) + PSB 10 kg ha\(^{-1}\) + Remaining RDF through chemical fertilizers resulted in the maximum net returns (Rs.3,64,676) with a benefit-cost ratio of 2.18.


ABSTRACT

The present investigation entitled “Effect of plant growth regulators on growth, flowering, yield and quality of french bean (Phaseolus vulgaris L.) cv. Arka Komal.” was carried out during Rabi (2009-2010) in student farm at College of Agriculture, Rajendranagar, Hyderabad. There are 10 treatments, each replicated thrice in RBD. The treatments consists of Gibberellic acid (150, 200 and 250 ppm), Naphthalene Acetic Acid (10, 15 and 20 ppm), Cycocel (250, 300 and 350 ppm) and Control (water spray).

The data collected at 60 days after sowing had revealed that the maximum plant height (55.66 cm), internodal length (10.56 cm) and number of branches per plant (15.08) were recorded with GA\(_{3}\) 250 ppm while maximum number of leaves per plant (34.40) were recorded in NAA 20 ppm. Among the plant growth regulator treatments studied, foliar spray of Cycocel 350 ppm recorded minimum number of days to flower bud initiation (31.50 days), days to 50% flowering (36.46 days) and days to first pod appearance (35.95 days).

Maximum leaf area index (0.79) and dry matter production (17.50 g) was observed in GA\(_{3}\) 250 ppm. Maximum chlorophyll content (47.18 SPAD units) was recorded in CCC 350 ppm. Foliar spray of GA\(_{3}\) 250 ppm recorded maximum number of pickings (3.50) and maximum number of pods per plant (12.53), maximum pod length (11.68 cm). GA\(_{3}\) 250 ppm
recorded maximum pod length (11.68 cm). Maximum pod diameter (1.07 cm) was observed in Cycocel 350 ppm.

GA$\textsubscript{3}$ 250 ppm recorded maximum weight of 10 pods (52.33 g), yield per plant (67.21 g), yield per plot (3.52 kg) and yield per ha (40.44 q), while control recorded 37.33 g of weight of 10 pods, 37.18 g of yield per plant, 2.05 kg of yield per plot and 28.17 q of yield per ha.

GA$\textsubscript{3}$ 250 ppm recorded minimum fiber content (3.18 g per 100 g of fresh pod) and maximum ascorbic acid content (12.40 mg/100g of fresh pod), Maximum protein content (3.02 g per 100 g of fresh pod) was observed in NAA 20 ppm. Even though the gross returns was maximum in GA$\textsubscript{3}$ 250 ppm, net returns was maximum in NAA 20 ppm. This may be because of high cost of GA$\textsubscript{3}$ which worked out low benefit cost ratio when compared to NAA, which is cheaper than GA$\textsubscript{3}$.

21) “Influence of leaf age on gel recovery and heating on quality and shelf life of aloe (Aloe barbadensis Miller)” - B.Amareswari

ABSTRACT

Aloe is a succulent, sessile, perennial herb. It is as old as human civilization. It was introduced for ornamental and medicinal purposes. Aloe is widely recognized for containing a number of unique organic phytochemicals in its leaves that favour human health. In the most recent years, many studies have been conducted to evaluate its role to control or cure many human diseases. An experiment was conducted to study the “Influence of leaf age on gel recovery and heating on quality, shelf life of Aloe gel”. The treatments consisted of three accessions of Aloe viz., yellow flowering accession-1, yellow flowering accession-2 and orange flowering accession-3 and three leaf maturity ages i.e., 10 months, 12 months and 14 months. The treatments are replicated thrice in Completely Randomized Design with factorial concept.

In all the three accessions of Aloe, 14 months leaf age has performed better regarding all the physical and physico-chemical parameters like leaf size (553.45 cm$^2$), leaf weight (480.22 g), gel weight (321.56 g), pH (4.79), TSS (0.78°brix), acidity (0.16%), reducing sugars (0.050%), total sugars (1.84%), antioxidants (64.08% inhibition of peroxidation) and moisture content (90.23%) of gel. The best leaf age in the first experiment viz., 14 months leaf age was selected for conducting the second experiment in all the three accessions. The gel obtained from the 14 months aged leaves of three accessions was subjected to heating at three temperatures i.e., 50°C, 75°C and 100°C. The treatment samples were analysed at every 10 days during storage for the study of quality parameters, storage stability and microbial count in the gel. During storage, increase in pH, reducing sugars and total sugars was observed in all the treatments while the acidity, TSS, non-reducing sugars, moisture and antioxidants were decreased at all storage intervals up to 30$^{th}$ day of storage.

Yellow flowering accession-1 heated at 75°C has recorded better results in pH (4.67), acidity (0.23%), TSS (1.30°brix) and antioxidant activity while the highest reducing sugars (1.853%), total sugars (2.55%) and moisture content (91.07%) was recorded by yellow flowering accession-1 heated at 50°C followed by the same accession heated at 75°C. Increase in microbial growth was observed with the storage period in all three accessions at all the temperatures. But, comparatively less microbial growth was observed when the Aloe gel was heated at 75°C. The Aloe gel was stored up to 30 days when heated at 75°C with less microbial count while they could be stored up to 20 days at both 50°C and 100°C temperatures in three accessions with less microbial count.

The overall results indicated that yellow flowering accession-1 with 14 months leaf age heated at 75°C has showed good quality and storage stability of Aloe gel followed by yellow flowering accession-2 and orange flowering accession-3.
22) “Effect of growth regulators on flowering, fruitset, yield and quality in phalsa (Greewia sub-inaegualis)” - Abhijet Debnath.

ABSTRACT

A field experiment entitled “Effect of plant growth regulators on flowering, fruitset, yield and quality in Phalsa (Greewia sub-inaegualis DC)” carried out during 2009-2010 in Model Orchard at College of Horticulture, Rajendranagar, Hyderabad.

The experiment was laid out in a Randomized Block Design with nine treatments and replicated thrice. The treatments consists of two levels each of Naphthalene acetic acid 25 and 50 ppm, Gibberellic acid 50 and 100 ppm, Kinetin 15 and 50 ppm, Ethrel 250 and 500 ppm and control. The growth regulators were applied twice i.e., first spray at pre bloom and second spray at post bloom stage. Data was recorded on number of flowers per shoot, days to 50 percent flowering, fruit set, number of fruits per bush, days to first picking, fruiting duration, crop duration, fruit weight and yield characters. Chemical analysis was done to determine quality parameters of the fruit.

The results revealed that application of NAA 25 ppm was effective in increasing the number of flowers per shoot (394.26), increasing fruitset 41.22 per cent over control, higher number of fruits per node (25.29), less number of days to 50 per cent flowering (51.17), flowering to fruit set (14.00 days) followed by GA_3 50 ppm.

Earlier days to first picking (96.00), less fruiting duration (18.17 days) and crop duration (115.17days) was recorded with GA_3 50 ppm treatment followed by NAA at 25 ppm and GA_3 100 ppm. GA_3 100 ppm was most effective in improving yield per plant (3.05 kg), yield per hectare (7.63 t ha^{-1}) and hundred fruit weight (61.48g) compared to NAA, kinetin, ethrel and control treatments. All the growth regulators significantly improved fruit quality i.e., TSS, acidity, TSS to acid ratio, reducing sugar, pulp weight, stone weight, pulp to stone ratio and shelf life of the fruit.

Ethrel 500 ppm recorded maximum total soluble solids content (25.72 %) and minimum was recorded in control (19.80%). Maximum reducing sugar (18.91%), TSS to acid ratio (10.98), Pulp weight (51.45g), pulp to stone ratio (5.85g) and minimum titratable acidity (2.26 %) and stone weight (8.83g) was recorded with GA_3 100 ppm compared to NAA, kinetin, ethrel and control. Kinetin 30 ppm recorded maximum shelf life (51.46 hrs) and minimum shelf life was recorded in control (36.12 hrs). Application of GA_3 100 ppm was found to be good for increasing the yields and improve quality of Phalsa fruits under the agro-climatic conditions of Hyderabad. The next better treatment was GA_3 50 ppm followed by NAA 25 ppm to increase yield and improve quality of Phalsa.

23) “Studies on heterosis, combining ability and identification of hybrids with resistance to yellow vein mosaic virus in okra (Abelmoschus esculentus (L.) Moench)” - K.Jagan

ABSTRACT

The present investigation was undertaken with the objective of identifying the high yielding parents and F1 hybrids with resistance to yellow vein mosaic disease by conducting appropriate studies in the extent of heterosis and combining ability of the parents and the resultant F1 combinations and also study the Character association and direct and indirect effect of yield attributes on fruit yield in Okra (Abelmoschus esculentus L.Monech). The study was conducted by raising four lines and fifteen testers as parents and their sixty F1 hybrids at Student Farm, Acharya N. G. Ranga Agricultural University, Rajendranagar, Hyderabad in a randomized block design with three replications during Kharif 2008-09. The data recorded for
fruit yield and its thirteen component characters were subjected to analysis to work out mean performance, genetic parameters, heterosis and combining ability, Character association, direct and indirect effect of yield components, identification of high yielding parents and F1 hybrids with resistance to yellow vein mosaic disease.

The analysis of variance revealed significant differences for characters viz., days to 50 per cent flowering, number of branches per plant, number of fruits per plant, and fruit yield. The lines, Arka Anamika and Varsha Uphaar the testers, IC-433670, IC-433645, IC-331217 and IC-433673 and the cross combinations, Arka Anamika x IC-331217, Arka Abhay x IC-331217, Arka Anamika x IC-326893, Arka Anamika x IC-433670, Arka Abhay x IC-332454, Arka Abhay x IC-433675, Varsha Uphaar x IC-433673, Parbhani Kranti x IC-433672, Varsha Uphaar x IC-331067 and Parbhani Kranti x IC-331217 were found to be superior for yield and its contributing characters.

The F1 hybrids, Arka Anamika x IC-331217, Arka Abhay x IC-331217, Arka Anamika x IC-326893, Arka Anamika x IC-433670, Arka Abhay x IC-332454 and Arka Abhay x IC-433675 recorded high degree of standard heterosis for yield and its contributing characters. Combining ability studies revealed the importance of both additive and non-additive gene action for all the characters studied. Among the lines, Arka Anamika, Arka Abhay and among the testers, IC-326893, IC-433670, IC-433673 and IC-433695 were found as best general combiners and the F1 cross combinations, Arka Abhay x IC-433675, Varsha Uphaar x IC-433673, Arka Anamika x IC-331217, Arka Abhay x IC-331217, Arka Anamika x IC-326893, Parbhani Kranti x IC-433672 and Varsha Uphaar x IC-331067 as good specific combinations were adjudged for yield and yield attributing economic characters.

The parents and crosses exhibited high heterosis for all the characters and high genetic advance as percentage of mean for plant height, number of branches per plant, number of fruits per plant, length of the fruit, node at which mosaic disease appears, days at first mosaic symptom appears and fruit yield lending scope for improvement of these traits by simple selection procedure. High estimates of heterosis obtained in hybrid combinations revealed considerable genetic divergence among the parental lines. The fruit yield was found to be strongly associated with number of fruits per plant, fruit length and fruit weight in both parents and crosses. The positive association between plant height, number of fruits per plant, length of the fruit, ten pods weight and fruit yield and negative association of days to 50 per cent flowering, diameter of the fruit, number of branches per plant with fruit yield per plant established in parents and their F1 combinations.

The parents, Arka Anamika, IC-433675, IC-433695 and the cross combinations, Arka Abhay x IC-332454, Arka Abhay x IC-328942, Arka Abhay x IC-433675, Arka Abhay x IC-331217, Arka Anamika x IC-326893, Arka Anamika x IC-433670, Arka Anamika x 433673, Arka Anamika x IC-331217, Parbhani Kranti x IC-433672, Varsha Uphaar x IC-331026 and Varsha Uphaar x IC-331067 were found to be best for high yielders along with yellow vein mosaic disease resistance.

Utilization of heterosis breeding to develop high yielding disease resistant hybrids, simple recurrent selection for increasing the frequency of desirable genes and back cross breeding to transfer YVMV disease resistant genes into any of the desirable lines are advisable to improve the material for further breeding programmers.
**ABSTRACT**

An experiment entitled “Standardization of harvesting stages and drying method on yield and alkaloid content in Solanum nigrum L.” was conducted at College Of Horticulture, Rajendra nagar, Hyderabad during December 2009 to May 2010. It consisted of four harvesting stages with three drying methods. The experiment was laid out in a Completely Randomized Block Design (CRBD) with factorial concept with three replications.

The objective of experiment was to identify the right stage of harvesting for maximum herbage and alkaloid yield, to evaluate the alkaloid content in the ratoon crop and to find out the appropriate drying method.

Amongst the growth parameters significantly highest plant height (131.79 cm), number of branches per plant (140 plant\(^{-1}\)), and plant spread (11217 cm\(^2\)) were recorded at berry ripening stage and a similar trend prevailed in ratoon crop. Whereas number of leaves per plant (613), leaf area per plant (4027 cm\(^2\)) was recorded maximum at mature green berry stage and same trend was recorded in ratoon crop.

Among the dry matter accumulation and its partition (at harvest), significantly highest stem dry matter (91.5 g) was recorded at berry ripening stage, maximum leaves and fruits (65.3 and 65.4 g) was significantly higher at mature green berry stage. However maximum dry matter (214.1g) was recorded at berry ripening stage. The drying methods had no significant influence on dry matter accumulation in stems and fruits. While, significant differences were found with respect to dry matter accumulation in leaves, which was maximum (48.4 g plant\(^{-1}\)) in D\(_3\) (oven drying)

Yield parameters were influenced significantly owing to the effect of harvesting stage. In the main crop maximum fresh herb yield per plant (675.26 g), fresh herb yield per hectare (24.96 t), dry herb yield per plant (141.34 g) and dry herb yield per hectare (5.23 t ha\(^{-1}\)), were recorded at berry ripening stage. Where as in ratoon crop highest fresh herb yield per plant (343.63 g), fresh herb yield per hectare (12.72 t), dry herbage yield per plant (76.78 g) and dry herb yield per hectare (2.83 t) were recorded at mature green berry stage.

Drying methods had no significant influence on dry herbage yield per hectare in main crop which being maximum under shade drying (3.77 t), however, drying methods had significant influence on dry herb yield in ratoon crop and the cumulative dry herb yield per hectare was also affected by drying methods.

The crop harvested at mature green berry stage and subjected to shade drying had the highest alkaloid (1.05 %w/w) and alkaloid yield per hectare was significantly higher at mature green berry stage (84.10 kg). Drying methods had significant influence on alkaloid yield per hectare and it was maximum (40.43 kg) under shade drying.

**ABSTRACT**

Study on ‘Evaluation of coloured Grape (Vitis vinifera L.) varieties for yield, juice recovery and quality’ was conducted at Grape Research Station, Andhra Pradesh Horticultural University, Hyderabad during September, 2009 to April, 2010. In the present investigation, nine coloured grape varieties viz., Pusa Navrang, Bangalore Blue, E12/2, Concord, Rubi Red, Gulabi x Bangalore Purple, Madhu Angur, Bangalore Purple and Black Cornechen were evaluated for vegetative, yield parameters, juice recovery and quality.
All the varieties showed significant difference in the parameters recorded. Fruitfulness of buds was highest in the variety Rubi Red (79.17%) followed by E12/2 (76.25%), Gulabi x Bangalore Purple (72.08%) and Pusa Navrang (65.2%) whereas, it was lowest in Bangalore Blue (58.33%). Fruitfulness was observed in lower buds i.e. from 3rd bud itself in Rubi Red, E12/2 and Gulabi x Bangalore Purple whereas, it was noticed from 5th bud in case of Concord, Bangalore Blue and Pusa Navrang. Fruitfulness extended up to 7th to 9th bud in the varieties tested.

Highest percentage of juice recovery was recorded in Pusa Navrang (76%) followed by Black Cornechen (74.33%) and Bangalore Purple (67.67%). Highest yield among the nine coloured varieties was recorded in E12/2 (19.06 kg vine⁻¹), followed by Rubi Red (18.41 kg vine⁻¹) and Gulabi x Bangalore Purple (14.31 kg vine⁻¹). The varieties Pusa Navrang, Rubi Red, Bangalore Blue and Madhu Angur may be considered as early juice varieties since they took less time from pruning to bud burst, bud burst to panicle emergence and harvesting.

Concord, Bangalore Blue, Black Cornechen and Pusa Navrang recorded highest TSS in juice and low acidity and were treated as sweetest juice varieties. Reducing and Non-reducing sugars were in proportion to the juice of Concord. Rubi Red and Madhu Angur were rich in ascorbic acid content whereas, Pusa Navrang, Black Cornechen and Rubi Red were rich in total anthocyanin content. Highest anti-oxidant activity was recorded in juice of Rubi Red followed by Pusa Navrang and Bangalore Blue by showing low per cent Thio Barbutyric Acid Reactive Substances. The juice of the Concord recorded the highest score for colour, appearance, flavour and overall acceptability followed by Bangalore Blue and Black Cornechen.

Highly significant direct correlation between yield per vine and fruitfulness of buds, average number of bunches, average bunch weight and pruning weight were observed. Fruitfulness of buds exhibited highly significant positive correlation with average bunch weight. There was significant positive correlation between number of bunches per vine and pruning weight and fruitfulness of buds. Average bunch weight had significant positive correlation with fruitfulness of buds and average number of bunches per vine. Anti-oxidant activity of juice had direct correlation with anthocyanins, TSS and brix acid ratio as they are negatively correlated with per cent Thio Barbutyric Acid Reactive Substances, whereas, ascorbic acid and acidity had indirect correlation with anti-oxidant activity as they are positively correlated with per cent Thio Barbutyric Acid Reactive Substances.


ABSTRACT

The present investigation “Exploitation of heterosis for yield and quality in tomato (Lycopersicon esculentum Mill.),” was carried out during rabi 2009-10 and summer 2010 at Vegetable Research Station, Rajendranagar, Hyderabad to study the heterosis, combining ability, gene action governing the inheritance of the traits and genetic parameters. Eight lines (EC-165749, EC-157568, EC-164838, EC-163611, LE-53, LE-56, LE-62 and LE-64) were crossed with three testers (Arka Alok, Arka Meghali and Arka Vikas) in line x tester mating design. The resultant 24 F1’s were evaluated along with their parents and two standard checks (Lakshmi and US-618) for sixteen characters viz., plant height (cm), number of primary branches per plant, days to 50% flowering, number of flowers per cluster, number of fruits per cluster, fruit length (cm), fruit width (cm), average fruit weight (g), yield per plant (kg), number of locules per fruit, pericarp thickness (mm), TSS (0Brix), titrable acidity (%), ascorbic acid (mg/100g), lycopene (mg/100g) and shelf life (days). Combining ability analysis revealed that magnitude of sea variance was greater than gca variance suggesting the predominance of
non-additive gene action for yield per plant, pericarp thickness, TSS, titrable acidity, lycopene and shelf life. The magnitude of degree of dominance revealed over dominance is the cause of heterosis for these traits. Based on gca effects of parents, the lines LE-53 and LE-62 and the tester Arka Alok were good general combiners for most of the traits. The cross combinations EC-157568 x Arka Vikas, EC-163611 x Arka Alok, LE-62 x Arka Alok and LE-64 x Arka Vikas were found to be superior for yield per plant. For quality traits, the cross EC-165749 x Arka Alok was superior specific combiner for yield per plant, TSS, ascorbic acid and shelf life and the cross EC-157568 x Arka Alok was superior specific combiner for TSS, titrable acidity and lycopene. Studies on heterosis revealed that majority of the hybrids exhibited relative heterosis, heterobeltiosis, standard heterosis in desirable direction. The hybrids exhibiting high per se performance also showed high standard heterosis. The cross combination LE-62 x Arka Vikas registered high negative standard heterosis (i.e. for earliness) for days to 50% flowering. The potential crosses like LE-64 x Arka Vikas (H x L), LE-53 x Arka Alok (H x H0, LE-53 x Arka Meghali (H x H), LE-64 x Arka Meghali (H x H), LE-62 x Arka Alok (H x H) exhibited high standard heterosis and high per se performance for yield per plant, which offers scope of commercial exploitation through Heterosis breeding. Among promising hybrids for yield per plant, the crosses LE-53 x Arka Alok for TSS and titrable acidity, LE-53 x Arka Meghali for titrable acidity and lycopene and LE-64 x Arka Meghali for titrable acidity and ascorbic acid showed significant standard heterosis. Hence, these are appreciable for processing purpose. The genetic variability studies indicated that genetic material in the present investigation possessed variability which provides sufficient basis for selection by breeder. High estimates of PCV and GCV were obtained for plant height, number of fruits per cluster, average fruit weight, yield per plant, titrable acidity, ascorbic acid and lycopene indicated a good deal of variability in those characters signifying the effectiveness of selection of desirable types for improvement. High heritability assisted with high genetic advance as per cent of mean was observed for plant height, number of primary branches per plant, number of fruits per cluster, fruit length, fruit width, average fruit weight, number of locules per fruit, pericarp thickness, titrable acidity, ascorbic acid, lycopene and shelf life. Hence, simple selection based on phenotypic performance of these traits would be more effective.

27) “Effect of soda oil dip method of raisin making on recovery and keeping quality of seedless grape varieties” - S.Vishala

ABSTRACT

The present investigation entitled “Effect of soda oil dip method of raisin making on recovery and keeping quality of seedless grape varieties” was conducted at Grape Research Station, Rajendranagar, Hyderabad. Seven varieties Viz., Fantasy Seedless, Crimson Seedless, A17-3, K.R.White, A18/3, Manik Chaman and Thompson Seedless were used in the study. The grapes were subjected to pre-drying treatment with soda oil dip method. There are seven treatments, replicated thrice in Complete Randomized Design. The average bunch weight observed maximum in Manik Chaman (344.66 g), the average berry weight was recorded maximum in Thompson Seedless (2.31 g), the berry diameter recorded maximum in Manik Chaman (17.66 mm), the total soluble solids recorded maximum in Manik Chaman (23.43° Brix), the acidity recorded maximum in A17-3 (0.71 %), the ascorbic acid recorded maximum in Fantasy Seedless (1.30 mg/100) and Thompson Seedless (1.30 mg/100), the total sugars and reducing sugars recorded maximum in Manik Chaman (21.42%) and (19.65%) respectively. The non-reducing sugars recorded maximum in A18/3 (2.35%).

The treated grapes were dried separately under shade in a well ventilated room. The highest recovery of raisins was recorded in Manik Chaman (24.60%) and minimum recovery of
raisins in A17-3 (20.85%). The highest average weight of raisins found in Manik Chaman (0.46%). The highest moisture was found in Manik Chaman (16.23%) and minimum was recorded in A17-3 (13.61%). The total soluble solids of raisins found highest in Manik Chaman (79.36° Brix) followed by Thompson Seedless (68.10° Brix). The highest acidity content of raisins was found in A17-3 (3.13%). The ascorbic acid of raisins found highest in Thompson Seedless (24.88 mg/100 g). The total sugars of raisins found maximum in Manik Chaman (66.57%) and minimum was found in A17-3 (58.75%). Reducing sugars found highest in Manik Chaman (62.81%) and least reducing sugars found in A17-3 (56.33%). The non-reducing sugars found highest in Manik Chaman (3.76%).

The stored raisins were then analyzed for their chemical quality properties. The highest average weight of raisins was found in Manik Chaman from 30 to 120 days and least was found in A17-3. The moisture content of raisins during storage was found highest in Manik Chaman and least in A17-3. The total soluble solids of raisins were found highest in Manik Chaman and least in A17-3. The acidity content of raisins recorded maximum in A17-3 and least in Manik Chaman. The ascorbic acid content of raisins was found highest in Manik Chaman and least was found in A17-3. The total sugars of raisins were found highest in Manik Chaman and least in A17-3. The reducing sugars content found highest in Manik Chaman and least in A17-3. The non-reducing sugars content found highest in Manik Chaman and least was in K.R.White. The mould damage recorded highest in A17-3 and lowest was recorded in Thompson Seedless.

The variety Manik Chaman gave high score in colour and appearance, Texture, Flavour, Taste and least score in A17-3. The overall acceptability was recorded highest in Manik Chaman and Thompson Seedless. The least overall acceptability was recorded in A17-3. The result revealed that Manik Chaman was superior for raisin making followed by Thompson Seedless and A18/3 with their rich contribution of high raisin recovery, high total soluble solids, high total sugars and bright colour and excellent raisin qualities. Manik Chaman with soda oil dip method acquired coloured flavoursome raisins. The soda oil dip method was most effective in obtaining high quality and organoleptic acceptability of raisins.

28) “Studies on response of grape (Vitis vinifera L.) Rootstocks for different levels of chloride salts” - K.Saritha

ABSTRACT

An experiment was conducted to study the response of grape rootstocks for different levels of chloride salts during October 2008 to May 2009 at Grape Research Station, APHU, Rajendranagar, Hyderabad. The experiment was laid out in a Factorial Completely Randomized Block Design with three replications. The treatments consisted of five rootstocks viz., Dogridge, Salt Creek, RS-19, SO4 and 1613-C with four chloride salts NaCl, KCl, CaCl2 and MgCl2 at five levels of salt concentrations i.e. normal irrigation as control, 4, 8, 16 and 32 meq of Cl/l i.w.

The dry weight of root to shoot ratio was significantly higher in Dogridge (0.6) and RS-19 (0.6) when compared to Salt Creek (0.5), SO4 (0.5) and 1613-C (0.5). In case of salts CaCl2 (0.6) and MgCl2 (0.6) recorded higher dry weight of root to shoot ratio than NaCl (0.5) and KCl (0.5) salt. There was a significant decrease in the dry weight of root to shoot ratio with increase in concentration of chloride salts.

Among the rootstocks with application of NaCl, the per cent reduction in growth parameters was less with SO4 (17.0%) and 1613-C (17.1%) and high with Salt Creek (21.9%). In case of KCl the lowest reduction was recorded in 1613-C (13.3%) and highest was with SO4 (19.4%). In respect of CaCl2, lowest was with 1613-C (15.4%) and highest with
Dogridge (17.1 %). In case of MgCl$_2$ salt, the lowest reduction in growth parameters was recorded with Salt Creek (13.4 %) and highest with RS-19 (17.1 %). Among chloride salts, the least per cent reduction in growth parameters was recorded with MgCl$_2$ (15.2%) and CaCl$_2$ (16.5%), whereas highest with NaCl (19.0%) followed by KCl (17.1%). This shows that rootstocks were more tolerant to CaCl$_2$ and MgCl$_2$ salts when compared to KCl and NaCl salts. Irrespective of chloride salts there was significant reduction in growth parameters with progressive increase in salt concentration.

With application of NaCl, among rootstocks the lowest reduction in root parameters was recorded with SO4 (30.8 %), whereas highest was with RS-19 (37.9 %). The lowest reduction due to KCl was recorded with 1613-C (30.4 %) whereas highest was with Dogridge (32.5%). In respect of CaCl$_2$, the lowest was recorded with SO4 (26.5 %) whereas highest was with Dogridge (31.1 %). In case of MgCl$_2$, the lowest per cent reduction in root parameters was recorded with 1613-C (24.6 %) whereas highest was with RS-19 (30.0 %). Among chloride salts, the reduction in root parameters was less with MgCl$_2$ (27.39 %), CaCl$_2$ (28.6 %) and it was high with NaCl (33.9 %) and KCl (31.4 %). Irrespective of chloride salts there was significant reduction in root parameters with progressive increase in salt concentration.

With application of different levels of NaCl, 1613-C and SO4 recorded the significantly lowest Na$^+$ content, when compared to Dogridge, RS-19 and Salt Creek. With application of different levels of KCl, 1613-C recorded the significantly lowest K$^+$ content in leaf as compared to other rootstocks. With application of different levels of CaCl$_2$, the significantly less Ca$^{2+}$ content in leaf was recorded with Dogridge and Salt Creek compared to SO4, 1613-C and RS-19. With regards to Mg content in leaf, there was no significant difference among rootstocks. There was progressive increase in ion content of leaf with increase in concentration of respective chloride salts.

The K/Na ratio in leaf of 1613-C, SO4 and RS-19 was significantly higher than Dogridge and Salt Creek. There was progressive decrease in K/Na content of leaf with increase in concentration of NaCl.

Dogridge recorded significantly less chloride content in leaf when compared to other rootstocks studied. Accumulation of chloride content in leaf was more with NaCl followed by KCl and it was less with CaCl$_2$ and MgCl$_2$ salt. There was progressive increase in chloride content of leaf with increase in concentration of NaCl followed by KCl when compared to CaCl$_2$ and MgCl$_2$.

The relative salt tolerance is judged based on reduction in growth parameters, dry weight of root to shoot ratio, ion content in leaf, K/Na ratio in leaf. Based on above criteria excepting dry weight of root to shoot ratio, with application of NaCl, KCl and CaCl$_2$ salts, 1613-C is relatively more salt tolerant than other rootstock studied. However Dogridge is commonly used rootstock in problematic soil due to its high vigour, high dry weight of root to shoot ratio and less accumulation of chlorides in leaves. Among chloride salts, the rootstocks are relatively tolerant to CaCl$_2$ and MgCl$_2$ salts when compared to KCl and NaCl salts. Irrespective of chloride salts, all rootstocks are sensitive to high salt concentration.
ABSTRACT

The present investigation was carried out during 2008-09 to study the genetic parameters, genetic divergence, character association and path co-efficient analysis in 50 genotypes of guar (Cyamopsis tetragonoloba (L.) Taub). The experiment was laid out at Vegetable Research Station, A.R.I, Rajendranagar in a randomized block design with three replications and observations were recorded on nineteen characters.

Analysis of variance indicated the presence of significant genotypic differences for all the components. The genotypes viz., IC-8592-1, CT-17, CT-28, IC-11357, CT-25, RGC-1025 and CT-19 showed high mean performance for seed yield and its components.

A perusal of genetic parameters revealed high phenotypic coefficient of variation and genotypic coefficient of variation for characters plant height, number of branches per plant, number of clusters per plant, number of pods per cluster, number of pods per plant, vegetable pod yield, pod weight, dry pod weight and dry pod yield. Further, high heritability coupled with high genetic advance as per cent of mean was recorded for plant height number of branches per plant, days to flower initiation, number of clusters per plant, number of pods per cluster, pod length, pod breadth, days to harvestable maturity, vegetable pod yield, dry pod weight, 100 seed weight, seed yield, protein content and gum content indicating the predominance of additive gene action in the inheritance of these traits. These characters can be further improved by following simple selection.

Genetic divergence studies by Mahalanobis D^2 analysis indicated the existence of significant diversity in 50 guar genotypes which were grouped into 7 clusters. The mode of distribution from different eco-geographical regions into various clusters was at random indicating that geographical and genetic diversity were not related. The characters number of branches per plant, dry pod yield and gum content contributed maximum towards genetic divergence. Based on Tocher’s method of clustering the genotypes viz., CT-14, CT-1, CT-25, IC-116731, PLG-72, CT-23, CT-12, Samrat and IC-8592-1 were suggested for inclusion in hybridization programme for obtaining desirable and novel recombinants.

Correlation studies indicated the positive and significant correlation of days to flower initiation, vegetable pod yield, number of clusters per plant and number of pods per plant with seed yield. Path coefficient analysis revealed that days to flower initiation, number of clusters per plant and number of pods per plant were the important attributes in formulating selection criteria for effective improvement of seed yield in guar.
“Studies on the influence of leaf age, preservatives and blending on the Composition and storage life of aloe gel” - Madiki Parimala Jyothi.

ABSTRACT

Aloe vera gel is used as a potential source to develop a wide variety of functional food products and is an ingredient in other value added food products, health drinks, beverages, cosmetic and toilet industry. It is used in the food products like refreshing juice, ready-to-serve drinks, health drinks, sport drinks, soft drinks, diet drinks, laxative drinks, sherbets etc. The fleshy portion can also be converted into candies, squash, jam, jellies etc. Additionally, it can also be incorporated to dairy products like Yogurt, curd, lassies, ice – creams etc.

A lab experiment, “Studies on the influence of leaf age, preservatives and blending on the composition and storage life of Aloe gel” was conducted at the Post Harvest Technology Laboratory, College of Horticulture, Rajendranagar, during the year 2008-2009. A set of two experiments were conducted in a Completely Randomized Block Design with factorial concept.

First set of experiment comprised four different age groups and four methods of gel preparation replicated thrice to study the composition of Aloe gel. Second set of experiment comprised four preservatives and four fruit pulps replicated thrice to study the composition and storage life of Aloe gel.

Among the four age groups of Aloe vera leaves, 14 months aged leaf recorded higher antioxidant activity(65.73), total sugars(1.832), pH(5.3), ascorbic acid(2.93), TSS(1.075), reducing sugars(0.047) and non-reducing sugars(1.785), thereby recorded higher chemical composition than the rest of the age groups of leaves used.

There is an increase in total sugars, pH, TSS, reducing sugars, non-reducing sugars and microbial count and decrease in the antioxidant activity, colour, ascorbic acid and moisture percentage during the period of storage.

Among the different preservatives used, the treatments with citric acid at 1.0% recorded higher amounts of antioxidant activity(64.49, 63.65 and 62.73 on first fifteenth and thirtieth day of storage respectively), total sugars(8.65, 9.09 and 9.70 on first fifteenth and thirtieth day of storage respectively), pH(4.16, 4.23 and 4.34 on first fifteenth and thirtieth day of storage respectively), ascorbic acid(4.98, 4.77 and 4.61 on first fifteenth and thirtieth day of storage respectively), TSS(10.74, 10.95 and 11.22 on first fifteenth and thirtieth day of storage respectively), reducing sugars(3.23, 4.11 and 5.05 on first fifteenth and thirtieth day of storage respectively) and non reducing sugars(5.75, 4.98 and 6.12 on first fifteenth and thirtieth day of storage respectively), moisture percentage(88.18, 87.99 and 87.64 on first fifteenth and thirtieth day of storage respectively) thereby recorded higher storage life with less microbial count.

Among the different fruit pulps blended pine apple fruit pulp blend with Aloe gel recorded higher total sugars(14.69, 14.85 and 15.28 on first fifteenth and thirtieth day of storage respectively), TSS(14.31, 14.59 and 14.88 on first fifteenth and thirtieth day of storage respectively), reducing sugars(4.08, 4.81 and 5.45 on first fifteenth and thirtieth day of storage respectively), non-reducing sugars(10.75, 10.05 and 10.81 on first fifteenth and thirtieth day of storage respectively) with least microbial count(5.3 and 3 bacterial and yeast/mould count, 7 and 5 bacterial and yeast/mould count on fifteenth and thirtieth day of storage). Similarly among the different fruit pulps blended guava recorded higher antioxidant activity (73.17, 72.23 and 71.30 on first fifteenth and thirtieth day of storage respectively) and ascorbic acid content(5.11, 4.89 and 4.73 on first fifteenth and thirtieth day of storage respectively).
ABSTRACT

The research work entitled “Effect of growth regulators and irradiation on shelf life of sapota (Manilkara achras (Mill.) Fosberg) cv. Kalipatti” was conducted at PHT lab, college of Horticulture, Rajendranagar, Hyderabad and irradiation unit, College of Agriculture, ANGRAU during December-January of 2009-2010. It consisted of three experiments involving effect of growth regulators, irradiation treatments and the combination of growth regulators irradiation treatments.

The experiment-I consist of growth regulators GA at 100ppm and 200ppm; 2,4-D at 2,4-D at 2ppm and 4ppm; Kinetin at 100ppm and 200ppm including control were replicated thrice duly design the experiment as CRD.

The experiment-II consists of irradiation at 0.2kGy, 0.4kGy, 0.6kGy, 0.8kGy including control and was replicated 4 times under CRD experiment design.

Similarly the experiment-III consists of best one of experiment-I + best one of experiment-II; best one of experiment-I + second best of experiment- II; second best of experiment- II + best one of experiment-II; second best of experiment- I + second best of experiment- II including control. It was replicated 4 times with experiment design of CRD.

The objectives of research work consists of
1. To study the effect of growth regulators on the extension of shelf life of sapota.
2. To study the effect of irradiation doses on the extension of shelf life of sapota.
3. To identify the synergy of growth regulators and irradiation doses on shelf life of sapota.
4. To study the qualitative changes in fruits during the storage period.

The results of the experiments showed that among growth regulators, GA3 200 ppm recorded lower physiological loss in weight (12.76%), spoilage (33.33%), ripening (58.92%), brix:acid ratio (146.46), higher acidity (0.15%), firmness (2.27kg/cm²), total soluble solids (23.81⁰B), reducing sugars (8.45%), total sugars (11.78%), organoleptic score (8.03) and thereby increased shelf life (12 days) of sapota and proved to be the best. It was observed that the physiological loss in weight and spoilage were increased and firmness and acidity decreased in all the treatments with the advancement of storage period.

Among the irradiation treatments, lower dose at 0.20 kGy recorded lower physiological loss in weight (14.73%), spoilage (31.52%), ripening (59.75%), brix:acid ratio (114.55) and higher firmness (1.97kg/cm²), acidity (0.15%), total soluble solids (23.43⁰B), reducing sugars (8.46%), total sugars (11.98%), organoleptic score (8.12) and thereby recorded higher shelf life (12.00 days). The combination treatment of GA3 200 ppm and irradiation dose of 0.20 kGy enhanced the shelf life upto 12 days. The fruits had higher firmness (2.21kg/cm²), higher total soluble solids (23.76⁰B), reducing sugars (7.89%), total sugars (11.65%) and organoleptic score (8.45).
ABSTRACT

The present investigation was undertaken to estimate the genetic divergence in okra and to carry out yield component analysis through correlation and path analysis. Thirty genotypes were sown in a randomized block design with three replications, during summer 2010 at Vegetable Research Station, Agriculture Research Institute, APHU, Rajendranagar, Hyderabad. The objective of the experiment was to identify divergent genotypes to use as donor parents in hybridization programmes.

The $D^2$ analysis was carried out for eighteen characters which partitioned the thirty genotypes into six clusters. The maximum genetic divergence was observed between cluster III and VI followed by between clusters III and IV. The maximum intra cluster distance was shown by cluster II. The characters fruit yield per plant, days to first flowering, number of nodes on main stem, first fruiting node and fruit width contributed greatly towards diversity. The clusters showing high genetic divergence could be effectively utilized in heterosis breeding programme. If a breeding programme is used at improving growth attributes like plant height, then cluster VI showing maximum plant height can be utilized in breeding programme. Therefore, a plant breeder may keep in mind the above aspects to obtain superior hybrids and good recombinants.

The analysis of variance revealed significant difference for eighteen characters studied suggesting considerable amount of variability exists among the genotypes. Wide range of variability was observed for plant height, fruiting period and fruit yield per plant indicating the scope for selection of suitable initial breeding material for further improvement.

GA as per cent of mean, GCV and PCV values are on par with each other for most of the characters suggesting that the influence of the environment on the traits was very negligible. The values observed are not confounding with the environment. It is a true to the reflection of the homeostasis effect or buffer reaction of the gene. Thus, the true reflection of the trait is exhibited.

In a true agreement with the GCV and PCV values in the present investigation for most of the characters was noticed, indicating additive genetic variance governing the high heritability with genetic advance as per cent of mean. Thus a breeder can employ a simple selection process which will rewarding one to improve the characters viz., plant height, internodal length, number of nodes on main stem, first fruiting node, average fruit weight, number of pickings and fruit yield per plant.

From correlation studies it was observed that fruit yield per plant has exhibited highly significant positive association with plant height, number of branches per plant, internodal length, number of nodes on main stem, fruit length, number of fruits per plant, average fruit weight, fruiting period and number of pickings. Therefore, it is emphasized to lay attention on these traits in crop improvement programme of okra in future.

The results on path analysis indicated that the characters which exhibited maximum positive direct effect on fruit yield per plant and positive associations like number of nodes on main stem, internodal length, average fruit weight and fruiting period would be more effective to bring improvement of yield and to evolve superior high yielding genotypes in okra.

On the basis of mean performance of the genotypes among traits studied, IC-43751 and IC-282226 were found to be best in almost all the attributes i.e., growth, earliness, fruit traits, biotic stresses and yield. So, these genotypes were considered the best genotypes and would be used as parental source in breeding programmes.
33) “Studies on modified atmospheric packaging and irradiation on shelf life and quality of sapota (Manilkara achras (Mill) fosberg) cv. Kalipatti” - Banothu Srinu

ABSTRACT

A set of two experiments on the effect polypropylene packaging (a modified atmospheric packaging) and combination of irradiation on storability at low temperature, shelf life and quality of sapota fruits cv. Kalipatti was conducted at Fruit Research Station, Sangareddy, APHU, A.P. In the first experiment sapota fruit cv. Kalipatti were packed in polypropylene bags of 100 and 150 gauge with and without perforation and stored at 15°C for 15 and 30 days and transferred to room temperature. Various physico-chemical parameters like PLW (%), Spoilage (%), Firmness(kg/cm²), TSS (°B), Sugar (%), Acidity (%) and TSS: Acid ratio were estimated at an interval of 3 days after transfer to room temperature. Fruits packed in polypropylene bags of 100 gauge without perforation recorded significantly lower PLW (%); fruits packed in polypropylene bags of 100 gauge with 0.1% perforation recorded significantly higher firmness, lowest spoilage (%) irrespective of days of storage 15°C. The fruits stored at 15°C for 30 days were ripened on initial days of transfer to room temperature and recorded significantly higher PLW (%), lower firmness(kg/cm²), on 3rd days (ripe stage) when compared to fruits stored at 15°C for 15 days. The fruits packed in 100 gauge with 0.1% perforation and stored in 15°C for 15 days has maintained higher TSS, sugar (both total and reducing sugars) and lower TSS: Acid ratio even up to 6th day after transfer to room temperature. The maximum total storability of 21 days (15 days at 15°C and 6 days at room temperature) was recorded in fruits packed in 100 gauge polypropylene with 0.1% perforation.

The best packaging material and storage days in experiment no 1 has to be irradiated at various dosages in 2nd experiment. However, in the first experiment as 15 days storage has proved better than 30 days storage at 15°C irrespective of packing material. Further to increase the total storability, the fruit after packaging in polypropylene bags of 100 gauge with 0.1% perforation of experiment-1 (best packing material) was irradiation at different doses of 0.2,0.4,0.6,0.8 kGy and stored at 15°C for 20 days in 2nd experiment. The fruit irradiated with 0.2 kGy has recorded significant lower PLW, higher firmness and lower sugar when compared to higher doses of irradiation and control. Fruits irradiated with higher doses of above 0.4 kGy recorded higher PLW, lower firmness and minimum shelf life after transfer to room temperature. Further, fruits irradiated at irradiation doses of above 0.4 kGy have shown irradiation injury and recorded highest spoilage then the fruits irradiated at lower dose of 0.2 kGy. The fruits packed in polypropylene 100 gauge with 0.1% perforation and irradiated at 0.2 kGy recorded significantly higher shelf life of 6 days after transfer to room temperature; increase the total storability to 26 days (20 days at low temperature and 6 days after room temperature).

34) “Effect of invigoration treatments on seed germination and seedling vigour in carry-over onion seed (Alium cepa L.).” - B.Somraj

ABSTRACT

Onion seeds have poor longevity and loose its viability very rapidly. Generally, the demand for seed fluctuates very often and sometimes there may be a surplus of seeds which need to be stored upto two to three sowing seasons. These carry-over seeds exhibit poor germinability and less vigour. Since, onion seeds found to be poor storers, maintenance of seed viability of carry-over seed lots is of great importance in the sowing seasons following the periods of low production. Hence, proper seed treatments are needed during storage to maintain the seed quality.
Keeping this in view, present investigation was taken up in order to find out the effect of invigoration treatments with growth regulators and chemical nutrients on seed germination and seedling vigour in carry-over onion seed.

Six different aged seed lots with one month interval from the date of expiry along with the fresh seed lot were subjected to invigoration treatments with growth regulators - GA_3 @ 100 ppm, 200 ppm, 400 ppm and NAA @ 50 ppm, 100 ppm, 150 ppm and chemical nutrients - KNO_3 @ 0.25%, 0.5%, 1.0%, Na_2HPO_4 @ 10^{-2} M, 10^{-4} M, 10^{-8} M and FeSO_4 @ 0.25%, 0.5%, 1.0% as well as control with distilled water were tested for seed germination and seedling vigour parameters.

Among different methods studied, between paper method was found superior to test seed germination for routine analysis in onion followed by top of the paper method, soil media method and sand media method. Irrespective of the methods used, fresh seed lot recorded maximum germination and decreased along with the age of the seed lots.

Fresh seed lots recorded higher values in seedling vigour indices, speed of germination and stress tests (brick gravel test, field emergence, cold test and paper piercing test). But, the values decreased as the seed age advanced. In contrast, Electrical conductivity of seed leachate recorded lower values in fresh seed lot and increased with the age of seed lot.

Invigoration treatment with growth regulators i.e. GA_3 and NAA were found effective in improving germination percentage, seedling vigour indices, stress tests and speed of germination especially with GA_3 @ 100ppm found superior to the seed lots treated with other growth regulators followed by NAA @ 100ppm.

Similarly, invigoration treatment with chemical nutrients i.e. KNO_3, Na_2HPO_4 and FeSO_4 were also found effective in improving germination percentage, seedling vigour indices, stress tests and speed of germination especially with KNO_3 @ 1% found superior to seed lots treated with other chemical nutrients followed by Na_2HPO_4 @ 10^{-4} M and FeSO_4 @ 1%.

Out of the various treatments used for invigoration of aged onion seed lots the best treatment found were GA_3 @ 100ppm followed by NAA @ 100ppm, KNO_3 @ 1%, Na_2HPO_4 @ 10^{-4} M and FeSO_4 @ 1% which helped to improve seed germination and seedling vigour in carry-over onion seed.

35) “Variability and vase life studies in tuberose (Polianthes tuberosa L.) Single cultivars” - Vijayalaxmi Mandula.

**ABSTRACT**

The present investigation entitled “Variability and vase life studies in tuberose (Polianthes tuberosa L.) single cultivars” was carried out during 2009-10 at AICRP on Floriculture, ARI, Rajendranagar, Hyderabad. The first experiment was laid out in Randomized Block Design comprising seven cultivars viz., cv. Prajwal, cv. Hyderabad Single, cv. Culcutta Single, cv. Rajath Rekha, cv. Sikkim Selection, cv. Phule Rajani and cv. Shringar as seven treatments. They were evaluated for different vegetative and floral attributes. The information generated was utilised for genetic studies like variability, character association and path coefficient analysis. In the second experiment, spikes of cv. Hyderabad Single obtained from the first experiment were used for vase life studies using distilled water as control (T_1), sucrose 4% + aluminium sulphate 150 ppm (T_2), sucrose 4% + aluminium sulphate 200 ppm (T_3) sucrose 4% + aluminium sulphate 250 ppm (T_4), sucrose 4% + citric acid 150 ppm (T_5), sucrose 4% + citric acid 200 ppm (T_6), sucrose 4% + citric acid 250 ppm (T_7).

The results of the experiment revealed that among the cultivars, cv. Prajwal performed better in respect of all the vegetative parameters studied, except for the character number of
leaves per plant where the cv. Culcutta Single recorded highest. Regarding the floral characters, cv. Phule Rajani was early in the spike initiation with less number of days taken for basal floret opening and 50% flowering. The cv. Prajwal was superior in respect of duration of flowering, number of florets per spike, diameter of the spike, hundred flower weight, fresh weight of the spike, yield of flowers per plant and per plot, while the cv. Culcutta Single recorded more number of spikes per plant. Space between florets was maximum for the cv. Sikkim Selection.

The genotypic coefficients of variation for all the characters studied were lesser than the phenotypic coefficients of variation indicating the masking effects of the environment. Leaf area, dry matter production and yield of flowers per plant recorded high phenotypic and genotypic coefficient of variation and high heritability coupled with high genetic advance as per cent of mean. This indicates the predominance of additive gene action and hence, simple selection may be effective to some extent. The remaining traits were mostly under the influence of non additive gene effects as they recorded low to moderate estimates of genetic advance.

The study on correlations and path analysis indicated that emphasis should be given for selection of plants possessing higher leaf area, dry matter production, duration of flowering, number of spikes per plant and fresh weight of spike so as to develop high yielding varieties as they registered strong positive and direct association with yield component. The spikes treated with holding solution of sucrose 4% + citric acid 250 ppm (T7) showed best results regarding maintenance of fresh weight and vase life for more number of days with high uptake of water and less loss uptake ratio.


ABSTRACT

A field experiment, “Studies on effect of mulches and nitrogen on growth, yield and quality of okra (Abelmoschus esculentus L.Moench)” was conducted at Model Orchard, College of Horticulture, Andhra Pradesh Horticultural University, Rajendranagar, Hyderabad during the year 2010-11. The experiment was laid out in Factorial Randomized Block Design with ten treatments and replicated thrice.

The treatment consists of (T1)- 100% Recommended dose of Nitrogen (RDN) + Black plastic mulch (25µ), (T2) 80% RDN+ Black plastic mulch (25µ) , (T3) 60% RDN + Black plastic mulch (25µ), (T4) 100% RDN + Green plastic mulch (25µ), (T5)80% RDN + Green plastic mulch (25µ), (T6) 60% RDN + Green plastic mulch (25µ), (T7) 100% RDN + Organic mulch (4’’thickness), (T8)80% RDN + Organic mulch (4’’ thickness), (T9)60% RDN + Organic mulch (4’’thickness), (T10)100% RDF + Soil mulch (Control).

The results of the experiment revealed that among the different treatments, maximum growth attributes viz., plant height, number of nodes, internodal length leaf area index, dry matter production , root length, root dry matter was recorded with black plastic mulch as compared to green plastic mulch , organic mulch and control. Maximum weed control was observed with black and green plastic mulch than organic and control. Weed were observed only in organic mulch and control such as Cynadon dactylon, Cyperus rotundus, Parthenium spp. The highest uptake of nitrogen was recorded with black plastic mulch than other mulches and control.
Further, the yield attributes like number of fruits per plant, fruit length, fruit weight, fruit yield per plant and fruit yield per hectare was recorded highest in black plastic mulch than green plastic mulch, organic mulch and control. However, the girth of the fruit was not influenced by mulching. Black plastic mulch recorded significantly higher soil moisture, temperature and soil nitrogen (after harvest) than green plastic mulch, organic mulch and control. Similarly, nitrogen significantly influenced the plant height, number of nodes, internodal length, leaf area index, dry matter production, root length, root dry matter. Among the different levels of nitrogen 100% nitrogen was found to be superior over other nitrogen levels in all the aspects.

The yield attributes like number of fruits per plant, fruit length, fruit weight, fruit yield per plant and fruit yield per hectare except fruit girth was recorded maximum with 100% nitrogen than 80% , 60% nitrogen and control. Nitrogen did not show any effect on weed control and days to first flower appearance. Also, nitrogen did not influence soil moisture and soil temperature. But highest soil nitrogen was recorded with 100% nitrogen and lowest in control. Interactions were significant for dry matter production, uptake of nitrogen, and for fruit yield attributes and fruit yield per hectare except for fruit girth. Among the various treatment combinations, black plastic mulch + 100% nitrogen was found to be significantly superior over other treatment combinations.

The results from the present study clearly showed that the organic mulch +100% nitrogen (T5) resulted in the maximum benefit cost ratio but among the plastic mulches black plastic mulch + 100% nitrogen (T1) recorded highest benefit cost ratio. Also the highest gross and net returns were recorded with black plastic mulch +100% nitrogen (T1).


**ABSTRACT**

The present investigation was undertaken to assess the per se performance, magnitude of heterosis and combining ability in ridge gourd during kharif and summer 2010-11 at Vegetable Research Station, Agriculture Research Institute, APHU, Rajendranagar, Hyderabad. The study was mainly contemplated to study the heterosis, combining ability, gene action governing the inheritance of the traits and find out the best general and specific combiners for higher yield.

The genotypes under the investigation comprised six lines (LA-30, RG-152, Chitrada, RGP-26, LA -31 and SRG-41) and three testers (Pusa Nasdar, Jaipur Long and Arka Sujat) were selected on the basis of per se performance for yield and were collected from Vegetable Research Station, Rajendranagar. Eighteen hybrids were generated and evaluated along with nine parents and two commercial checks (Green Beauty and Viva Beauty) for the sixteen characters viz., vine length (m), days to first staminate flower appearance, days to first pistillate flower appearance, node of first staminate flower appearance, node of first pistillate flower appearance, days to 50 per cent flowering, number of staminate flowers per vine, number of staminate flowers per vine, number of pistillate flowers per vine, sex ratio, fruit set per cent, fruit length (cm), fruit girth (cm), number of fruits per vine, average fruit weight (g), leaf area and yield per vine (kg).

Combining ability analysis revealed that the ratio of gca variance ($\sigma^2_{gca}$) to sca variance ($\sigma^2_{sca}$) of less than unity (<1) indicating the preponderance of non-additive gene action for all the traits. Since non-additive gene action was predominant for yield and yield contributing characters, it is advocated to undertake heterosis breeding among parents for genetic improvement of these characters in ridge gourd. RGP-26 and LA-31 among lines and
Pusa Nasdar and Jaipur Long among testers were good general combiners and are recommended for use in breeding programmes to improve yield and quality in ridge gourd. The cross combinations RGP-26 x Pusa Nasdar, LA-31 x Pusa Nasdar, LA-30 x Jaipur Long and RG-152 x Pusa Nasdar were found to be superior for yield per vine. For node of first pistillate flower appearance, number of pistillate flowers per vine, sex ratio, fruit girth and average fruit weight the cross LA-31 x Pusa Nasdar was superior specific combination.

Studies on heterosis revealed that the hybrids exhibiting high per se performance also showed high standard heterosis. The cross combination RG-152 x Arka Sujat registered highest negative standard heterosis for days to 50 % flowering. Significant standard heterosis for number of fruits per vine was expressed by the crosses LA-30 x Jaipur Long, RG-152 x Pusa Nasdar, RGP-26 x Pusa Nasdar, LA-31 x Pusa Nasdar and LA-31 x Arka Sujat. The potential crosses like RGP-26 x Pusa Nasdar, LA-31 x Pusa Nasdar, LA-30 x Jaipur Long and RG-152 x Pusa Nasdar exhibited appreciable standard heterosis and high per se performance for yield per vine, which offers scope for commercial exploitation.

38) “Studies on integrated weed management in carrot (Daucus carota L.)” - Kadarla Chaitanya.

ABSTRACT

A field experiment entitled “Studies on integrated weed management in Carrot (Daucus carota L.)” was conducted during rabi, 2010-2011 in the Vegetable Research Station, ARI, APHU, Hyderabad.

Among the different weed management practices, application of metribuzin (PE) @ 0.3 kg a.i ha\(^{-1}\) + hand weeding at 30 DAS recorded significantly highest weed control efficiency (WCE). The lowest weed index (WI) (8.28 %) was recorded in farmers practice of hand weeding at 30 and 60 days after sowing.

Among the different weed management practices, metribuzin (PE) @ 0.3 kg a.i ha\(^{-1}\) + hand weeding at 30 DAS produced significantly tallest plants, higher fresh weight of roots, higher length and girth of root and higher root yield (21.72 t ha\(^{-1}\)).

None of the herbicides and their combinations had any phytotoxic effect on the carrot plants. Herbicides, their combinations and their integration with hand weeding produced significant differences in growth parameters, yield components and yield of carrot crop.

Among the different integrated weed management practices the net returns (Rs. 162900 ha\(^{-1}\)) and B: C ratio (2.38) were significantly higher with the pre emergence application of metribuzin @ 0.3 kg a.i ha\(^{-1}\) + hand weeding at 30 DAS.

39) “Studies on the effect of plant densities and phosphorus levels on the growth and yield of vegetable cowpea (Vigna unguiculata L.)” - Ravikumar Kuna.

ABSTRACT

The present investigation entitled “STUDIES ON THE EFFECT OF PLANT DENSITIES AND PHOSPHORUS LEVELS ON THE GROWTH AND YIELD OF VEGETABLE COWPEA (Vigna unguiculata L.)” was carried out during 2010-2011 at College of Horticulture, Venkataramannagudem, Andhra Pradesh Horticultural University, West Godavari (Dist.).

In this study, there are 12 treatments each replicated thrice in factorial RBD. The treatments included three levels of plant densities and four levels of phosphorus. The study revealed that the crop responded to plant densities as well as phosphorus levels. The biometric
characters like number of primary branches per plant, pod length, pod girth, number of pods per plant, number of seeds per pod, pod weight per plant and pod yield per plant were favorably influenced by lower density plants (D1 : 37,037 plants ha\(^{-1}\)) and a phosphorus levels of 60 kg ha\(^{-1}\) (\(P_3\)) compared to other levels.

The growth and yield characters like plant height, days to flowering, days to first picking, number of pickings and pod yield ha\(^{-1}\) were showed better expression in case of high density planting (74,074 plants ha\(^{-1}\)) and 60 kg P\(_2\)O\(_5\) ha\(^{-1}\) (\(P_3\)). Similarly the N P K uptake was more in high density plants (\(D_3\)) and 60 kg P\(_2\)O\(_5\) ha\(^{-1}\) (\(P_3\)). The available soil N P K after experiment was comparatively high in low density plants with increasing levels of P. Total dry matter accumulation ha\(^{-1}\), protein content in pod, gross returns, net returns and Benefit: Cost ratio were also higher at higher density plants (\(D_3\)) and higher dose of phosphorus (\(P_3 : 60\) kg P\(_2\)O\(_5\) ha\(^{-1}\)).

The interaction effect of plant densities and phosphorus levels were not significant on number of branches per plant at 45 DAS, number of pods per plant, number of seeds per pod and shelf life of pods. Significant differences were observed in plant height, total dry matter accumulation and days to flowering. The parameters like pod length, pod weight per plant, yield per plant, pod yield ha\(^{-1}\), protein content in pod and N P K uptake by plant were also significant with interaction effect of densities and P levels. Similarly the gross returns, net returns and Benefit: Cost ratios were also higher with the treatmental combination of high density planting (74,074 plants ha\(^{-1}\)) and 60 kg P\(_2\)O\(_5\) ha\(^{-1}\) (\(D_3P_3\)).

40) “Integrated weed management in tomato (\(Lycopersicon\) esculentum \(L\).)” - Sunil Kumar M.  

ABSTRACT

A field experiment entitled \textit{Integrated weed management in Tomato (\(Lycopersicon\) esculentum \(L\).)} was conducted at the Model orchard of College of Horticulture, Rajendranagar, Hyderabad during rabi, 2010-11. The experiment was carried out using tomato cv. Arka Vikas with 13 treatments viz., Pendimethalin (PE) @1.0 kg a.i ha\(^{-1}\), Pendimethalin (PE) @ 1.0 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT, Pendimethalin (PE) @ 1.0 kg a.i ha\(^{-1}\) + Quinalofop ethyl @50 g a.i ha\(^{-1}\) (POE), Metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\), Metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT, Metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + Quinalofop ethyl (POE) @50 g a.i ha\(^{-1}\), Oxadiargyl (PE) @ 100 g a.i ha\(^{-1}\), Oxadiargyl (PE) @ 100 g a.i ha\(^{-1}\) + hand weeding at 30 DAT, Oxadiargyl (PE) @ 100 g a.i ha\(^{-1}\) + Quinalofop ethyl (POE) 50 g a.i ha\(^{-1}\), Quinalofop ethyl (POE) @ 50 g a.i ha\(^{-1}\), Quinalofop ethyl (POE) @ 50 g a.i ha\(^{-1}\) + hand weeding at 30 DAT, Farmers practice of hand weeding at 20 and 40 DAT and \textit{Unweeded control}.

Among the different weed management practices, application of metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT recorded significantly highest weed control efficiency (WCE). The lowest weed index (WI) (5.30 %) was recorded in farmers practice of hand weeding at 20 and 40 days after transplanting.

Among the different weed management practices, metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT produced significantly tallest plants, higher dry weight of tomato plants, higher average fruit weight (86.22 g) and higher fruit yield (30.33 t ha\(^{-1}\)).

Application of metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + quinalofop ethyl (POE) @ 50 g a.i ha\(^{-1}\) recorded lowest number of days for flower initiation and 50% flowering.

The nutrient (N, P and K) uptake was significantly highest (128.40, 30.26 and 139.51 kg ha\(^{-1}\) N, P and K respectively) with application of metribuzin (PE) @ 0.5 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT.
Among the different integrated weed management practices the net returns (Rs. 100735 ha\(^{-1}\)) and B:C ratio (1.98) were significantly higher with the pre emergence application of metribuzin @ 0.5 kg a.i ha\(^{-1}\) + hand weeding at 30 DAT.

41) “Studies on modified atmospheric packaging and antioxidants on shelf life of custard apple (\textit{Annona squamosa} L.) Cv Balanagar” - Ambotu Venkatram.

ABSTRACT

A set of three experiments on the effect of MAP (fruits packed in polypropylene bags with 3\% O\(_2\) + 5\% CO\(_2\) or 3\% O\(_2\) + 10\% CO\(_2\) or 5\% O\(_2\) + 5\% CO\(_2\) or 5\% O\(_2\) + 10\% CO\(_2\) or air), antioxidants (500, 1000 ppm of sodium benzoate and ascorbic acid and 50, 100 ppm of benzyl adenine) and combination of MAP (first two best of MAP) and antioxidants (three best antioxidants) on shelf life and quality of custard apple fruits cv. Balanagar stored at 15 ±1˚C, was conducted at Fruit Research Station, Sangareddy, APHU, A. P. In all the experiments the design adopted is completely randomized design with factorial concept with three replications per treatment. Various physical parameters like PLW (%), Firmness (kg cm\(^{-2}\)), Spoilage (%), Ripening (%), Days taken for ripening and Shelf life (days) and biochemical parameters like TSS (°Brix), Acidity (%), Brix-acid ratio, Sugars (%) and Ascorbic acid (mg/100 g) were estimated at an interval of 2 days during storage in all the experiments.

Custard apple fruits cv. Balanagar were packed in polypropylene bags with different concentrations of O\(_2\) and CO\(_2\) or air and stored at 15 ±1°C. Fruits packed in polypropylene bags with 3\% O\(_2\) + 10\% CO\(_2\) recorded significantly lower PLW than control fruits. Significantly the highest firmness was recorded in fruits packed in polypropylene bags with 5\% O\(_2\) + 10\% CO\(_2\). Maximum days taken for ripening was recorded in fruits packed in polypropylene bags either with 5\% O\(_2\) + 10\% CO\(_2\) or 5\% O\(_2\) + 5\% CO\(_2\) or 3\% O\(_2\)+10\% CO\(_2\). Fruits packed in polypropylene bags with air or 3\% O\(_2\) + 5\% CO\(_2\) recorded significantly lower spoilage and correspondingly increased the shelf life upto 12.28 and 12 days, respectively. Fruits packed in polypropylene bags with air were superior for appearance and overall acceptability. The control fruits recorded a shelf life of 8.5 days only. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) were significantly lower in fruits packed in polypropylene bags with 3\% O\(_2\) + 10\% CO\(_2\) than control fruits indicating delayed ripening. Significantly the highest acidity was recorded in fruits packed in polypropylene bags irrespective of concentration of O\(_2\) + CO\(_2\) or air. Significantly the lowest non-reducing sugars and highest ascorbic acid were recorded in fruits packed in polypropylene bags with 3\% O\(_2\) + 10\% CO\(_2\) or 5\% O\(_2\) + 5\% CO\(_2\) or 5\% O\(_2\) + 10\% CO\(_2\) or 3\% O\(_2\)+5\% CO\(_2\).

Custard apple fruits cv. Balanagar were dipped in different concentrations of antioxidants and stored at 15 ±1°C. Fruits treated with benzyl adenine 100 ppm recorded significantly lowest PLW than control fruits. Significantly highest firmness was recorded in fruits treated with benzyl adenine 100 ppm. Fruits treated with benzyl adenine 100 ppm were superior for appearance and overall acceptability. Maximum days taken for ripening was recorded in fruits treated with benzyl adenine with both concentrations (50 ppm and 100 ppm) and sodium benzoate 500 ppm. Fruits treated with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm recorded significantly lower spoilage and correspondingly increased the shelf life upto 11, 10.5 and 10 days, respectively. The control fruits recorded a shelf life of 8.5 days only. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) was recorded the lowest and ascobic acid recorded the highest in fruits treated with benzyl adenine 100 ppm. The treated fruits recorded significantly the highest acidity and the lowest non-reducing sugars irrespective of antioxidants and their concentrations.
Custard apple fruits cv. Balanagar were treated with three best antioxidants (benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm) and then packed in two best treatments of MAP (fruits packed in polypropylene bags with air and fruits packed in polypropylene bags with 3% O₂ + 5% CO₂) and stored at 15 ±1°C. Fruits treated with benzyl adenine 100 ppm and then packing in polypropylene bags with 3% O₂ + 5% CO₂ recorded significantly lowest PLW and highest firmness than control fruits. Fruits treated with benzyl adenine 100 ppm and then packed in polypropylene bags with air were superior for appearance and overall acceptability. Fruits treated either with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm and then packed in polypropylene bags with air recorded significantly lowest spoilage and maximum days taken for ripening and correspondingly increase the shelf life upto 13.33 days. The control fruits recorded a shelf life of 8.9 days only. Biochemical parameters like TSS, brix-acid ratio and reducing sugars were recorded the lowest and ascorbic acid recorded the highest in fruits treated either with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm and then packed in polypropylene bags with air recorded significantly lowest spoilage and maximum days taken for ripening and correspondingly increase the shelf life upto 13.33 days. The control fruits recorded a shelf life of 8.9 days only. Biochemical parameters like TSS, brix-acid ratio and reducing sugars were recorded the lowest and ascorbic acid recorded the highest in fruits treated either with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm and then packed in polypropylene bags with 3% O₂ + 5% CO₂. Significantly lowest non-reducing sugars, total sugars and highest acidity were recorded in treated fruits irrespective of antioxidants and then packed in polypropylene bags with 3% O₂ + 5% CO₂ or air. The combination of MAP and antioxidants enhanced the shelf life of 1.33 and 2.83 days over the MAP or antioxidants used alone, respectively.

42) “Effect of phosphorus and plant growth regulators on growth, yield and quality of fenugreek (Trigonella foenum graecum L.)” - G.C.Gangaram

ABSTRACT

A field experiment entitled “Effect of phosphorus and plant growth regulators on growth, yield and quality of fenugreek (Trigonella foenum-graecum L.)” was carried out at Model orchard, College of Horticulture Rajendranagar during the rabi, 2010-11.

The significant effect of the phosphorus were observed for plant height 50.13, number of branches 5.38, fresh weight of plant 2610.29, dry weight of plant 649.96, number of pods per plant 26.21, number of seeds per pod 15.02, test weight 13.08, seed yield 15.91, straw yield 42.12, biological yield 55.68, protein content of seed 21.41, and chlorophyll content of leaves at both stages 1.52. However highest N, P, K content of seed was observed with RDF.

The significant effect of plant growth regulators were observed for plant height 51.96 and days to 50 % flowering 42.66 maximum with the treatment 50 ppm GA₃, were minimum with the treatments 75 ppm Ethrel. The significant effect of plant growth regulators were observed for higher number of branches with 75 ppm Ethrel. Among the different treatment combinations, plant growth regulators and phosphorus were observed for number of branches , number of pods per plant, number of seeds per pod, test weight, seed yield, straw yield, biological yield, N, P, K content of seed, protein content of seed, and chlorophyll content of leaves was observed in 60 kg phosphorus with 20 ppm NAA.

Among the different treatment combinations, plant growth regulators and phosphorus application of at 60 kg phosphorus with GA₃,50ppm had significant effect on plant height at 30, 60 DAS and at harvest with a mean maximum 12.00 cm, 37.21 cm and 56.64 cm, while minimum observed was 10.58 cm, 26.58 cm and 40.68 cm with application of 20 kg phosphorus with Ethrel 75 ppm at 30, 60 DAS and at harvest respectively.The highest cost benefit ratio was obtained with the treatment “60 kg Phosphorus /ha with 20 ppm NAA”. The worked out economics revealed that, the maximum revenue (Rs.8692/ha) and net profit (Rs.32096/ha) were obtained from 60 kg phosphorus/ha with 20 ppm NAA.
43) “Integrated weed management in onion (*Allium cepa* L.)” - B.Ramachandraiah

**ABSTRACT**

A field experiment entitled “Integrated weed management in onion (*Allium cepa* L.)” was conducted at the Model orchard of College of Horticulture, Rajendranagar, Hyderabad during the year 2010-11.

Among the different integrated weed management practices, oxadiargyl @ 90 g a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₆) recorded highest weed control efficiency (WCE) of 91.54, 90.08, 85.57 and 82.87% at 30, 60, 90 and harvest respectively. The lowest weed index (WI) (8.19 %) was recorded in pendimethalin C.S @ 0.75 kg a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₄) at 2-3 leaf stage of weed. Among the different integrated weed management practices, oxadiargyl @ 90 g a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₆)produced significantly tallest plants, with more number of leaves, highest dry weight of onion plants, equatorial (6.71 cm.) and polar diameter (6.26 cm.) of the bulb, average weight of bulb (64.70 g), and marketable bulb yield (27.96 t ha⁻¹) and it was on par with pendimethalin C.S @ 0.75 kg a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₄).

The nutrient uptake (N,P and K) was significantly highest (48.20, 16.36 and 82.56 kg ha⁻¹ respectively) with application of oxadiargyl @ 90 g a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₆)at 2-3 leaf stage of weed but was on par with pendimethalin C.S @ 0.75 kg a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₄). Among the different integrated weed management practices the net returns (Rs.14152 5 ha⁻¹) and B:C ratio (2.61) were significantly higher with the application of oxadiargyl @ 90 g a.i. ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₆) at 2-3 leaf stage of weed and it was on par with pendimethalin C.S @ 0.75 kg a.i ha⁻¹ (PE) + quizalofop ethyl @ 75 g a.i ha⁻¹ (POE) (T₄).


**ABSTRACT**

The present investigation entitled “STUDIES ON THE EFFECT OF ORGANIC MANURES AND INORGANIC FERTILIZERS ON GROWTH, YIELD AND QUALITY OF OKRA (*Abelmoschus esculentus* L.) cv. Arka Anamika.” was conducted from October, 2010 to January, 2011 at Horticultural Research Station (HRS), Venkataramannagudem, West Godavari dist. There are 12 treatments, each replicated thrice in RBD.

An increase in vegetative growth was observed with T₁ Treatment which received recommended dose of NPK (100:50:50 kg /ha). Significantly highest plant height (104.42 cm) was recorded with T₁ over the other treatments but was on par with T₆ (94.12 cm), T₆ (91.01 cm), T₈ (90.79 cm) and T₇ (90.26 cm). The lowest plant height (61.30 cm) was recorded with T₁₂ - control (No fertilizers + No organic manures). Plant girth (3.18 cm), number of nodes per plant (15.07), fresh weight of plant (171.17 g) and dry weight of plant (53.77 g) were recorded maximum with T₁ Treatment which received recommended dose of NPK (100:50:50 kg /ha). The lowest plant girth (1.06 cm), number of nodes per plant (5.80), fresh weight of plant (40.67 g) and dry weight of plant (11.50 g) were observed with T₁₂(control). However the highest inter nodal length (12.76 cm) was recorded with T₆, i.e., 50% of RDF +25% of RDN through poultry manure +25% of RDN through vermicompost and the lowest inter nodal length (6.64 cm) was recorded with T₁.
T₁ treatment which received recommended dose of NPK (100:50:50 kg/ha) recorded least number of days to 50 percent flowering (32.80) and first picking (38.47). While, T₁₂ treatment (control) recorded highest number of days to 50 percent flowering (47.33) and first picking (55.00). Similarly, yield and yield attributing characters were highest with the treatment which receives completely recommended inorganic fertilizers (T₁). Number of pods per plant (16.47), pod length (17.07 cm), pod weight (15.00 g), yield per plant (238.33 g), yield per plot (10.29 kg), number of seeds per pod (69.20) and pod yield per ha (135.83 q/ha) were recorded maximum with the T₁ treatment. Minimum number of pods per plant (7.80), pod length (8.47 cm), pod weight (8.60 g), yield per plant (66.36 g), yield per plot (2.85 kg), number of seeds per pod (39.07) and pod yield per ha (37.70 q/ha) were recorded with the T₁₂ treatment (control).

Soil fertility status results after the crop harvest revealed that the available nitrogen is maximum in T₁ (248 kg ha⁻¹) and minimum in T₅ (203 kg ha⁻¹). Available phosphorus is maximum (41 kg ha⁻¹) in T₃ and minimum (16 kg ha⁻¹) in T₁₂. Where as available potassium is maximum (88 kg ha⁻¹) in T₃ and T₇ treatments and minimum (47 kg ha⁻¹) in T₁₂ treatment. The nitrogen uptake was significantly highest (148.08 kg/ha) in the treatment T₁ over all other treatments. The least uptake of nitrogen was found in the treatment T₁₂ (66.18 kg/ha).

Among the quality parameters, fibre content was least (10.03 %) in T₈ treatments and the maximum fibre content (12.07 %) was recorded in T₁₂ treatment which differed significantly over the other treatments but was on par with T₁ (11.20 %). Maximum protein content (16.37 %) was recorded in T₅ treatment which is on par with T₂ (14.40 %), T₆ (15.28 %), T₇ (15.37 %) and T₈ (14.93 %). The protein content was minimum (10.67 %) in T₁₂ treatment and was on par with T₃ (17.33 12.67), T₆ (19.33 mg/100g), T₇ (19.00 mg/100g) and T₁₀ (18.67 mg/100g). Ascorbic acid content was lowest (12.67 12.67) in T₁₂ treatment (control).

Cost economics results reveal that T₁ treatment recorded higher gross returns (Rs 2,71,600 per ha), net returns ( Rs 2,08,318 per ha) and higher benefit cost ratio (4.29). However,T₁₂ treatment (control) showed minimum gross returns (Rs 75,400 per ha), net returns (Rs 15,158 per ha) and least benefit cost ratio (1.25).

45) “Studies on effect of mulches and micronutrient foliar sprays on growth and flowering in gladioli (Gladiolus grandiflorus L.)” - Yalek Messar.

**ABSTRACT**

A field experiment “Studies on effect of mulches and micronutrient foliar sprays on growth and flowering in gladioli (Gladiolus grandiflorus L.)” was conducted at AICRP on Floriculture, Agricultural Research Institute, Rajendranagar, Hyderabad during the year 2010-2011. The experiment was laid out in Randomized Block Design comprising of ten treatments, T₁-Black polythene mulch (25μ), T₂- Black polythene mulch (25μ) + 1.0% FeSO₄, T₃- Black polythene mulch (25μ) + 0.75% ZnSO₄, T₄-Red polythene mulch (25μ), T₅- Red polythene mulch (25μ) + 1.0% FeSO₄, T₆-Red polythene mulch (25μ) + 0.75% ZnSO₄, T₇- White polythene mulch (25μ), T₈- White polythene mulch (25μ) + 1.0% FeSO₄, T₉-White polythene mulch (25μ) + 0.75% ZnSO₄, T₁₀-Soil mulch(control). The entire field was replicated thrice.

The results of the experiment revealed that among the mulches, Black polythene mulch recorded earliest sprouting and soil mulch i.e, control the late sprouting. The treatment T₂ produced tallest plant while the maximum leaf area was produced in treatment T₃. There was no effect of any of the treatments on the number of leaves of the gladiolus plant.
Earliness in days taken for spike initiation, and the maximum number of spikes per plot was observed in T1 (Black polythene mulch 25 µ) while minimum days for 50% flowering and days for basal flower opening was observed in T2. Spike quality attributes like spike length, florets per spike, weight of spike, diameter of flower were more for the treatment T2 but the increase in rachis length was observed in T3. No significant difference were observed for the characters like number of spikes per plant and number of florets open at a time among different treatments.

Corm weight per plant and size of corms was highest in treatment T2 and the similar trend was observed for number of cormels per corm and cormel weight. N, P, K and Zn content of the gladiolus plant were observed maximum with the treatment T3 while the treatment T2 recorded maximum content of the iron in gladiolus plant. The worked out economics revealed that, the maximum B:C ratio was obtained from the plots applied with Black polythene mulch and FeSO₄ 1.0% (T2).


ABSTRACT

The present investigation on “Studies on effect of pre-sowing seed treatments and standardization of vegetative propagation technique in Jackfruit (Artocarpus heterophyllus Lam.)” was carried out during 2010-2011 at Horticultural Research Station, Venkataramannagudem, Andhra Pradesh. The present investigation was divided into two experiments and both were carried out simultaneously. In the first experiment, the effect of pre-sowing seed treatments on germination and seedling growth of Jackfruit (Artocarpus heterophyllus) were studied, while in the second experiment the scion sticks of two cultivars viz., Singapore and Palur were grafted on Jackfruit seedlings by two methods of grafting (Veneer and Soft wood method) at monthly intervals starting from July 2010 to October 2010 in two environmental conditions viz., open and polyhouse condition on graft success and growth.

Jackfruit seeds were soaked in gibberellic acid, naphthalene acetic acid, potassium nitrate and in water for 12 hours and 24 hours period after washing thoroughly with water and then sown in polybags. Soaking seed in GA₃ 200 ppm for 24 hours resulted in higher per cent of germination (77.33%), early initiation of germination (4.00 days) and lowest number of days taken for 50 per cent germination (11.00 days), maximum seedling height (72.11 cm), maximum seedling girth (0.78 cm), higher internodal length (4.66 cm), higher absolute growth rate (0.62 cm. day⁻¹) and higher root-shoot ratio (0.24 cm), while seed soaked in KNO₃ 0.5% for 24 hours recorded maximum number of leaves, maximum length, width of leaf and leaf area per seedling (28.2, 14.45 cm, 7.69 cm and 2526 cm² respectively). Further, seed treated with NAA 50 ppm for 24 hours have recorded maximum primary root length (15.25 cm) and maximum secondary root length (17.35 cm).

In standardization of vegetative propagation technique, early sprouting of scion (15.33 days), higher per cent of graft success (75.97%), maximum number of leaves (8.67) and maximum leaf area per graft (200.00 cm²) were obtained under polyhouse condition during October through veneer method in cv. Singapore, while grafts prepared during October through softwood method in Singapore variety under polyhouse condition recorded maximum scion length (16.91 cm), maximum absolute growth rate (1.1 cm/day) and attained plantable size at an early date (127.70 days). Further, maximum girth at graft union (0.83 cm) was found during October through veneer method in cv. Singapore under open condition, while maximum
internodal length (1.31 cm) was observed during October through veneer method in Palur variety under polyhouse condition.

The grafting environment with congenial microclimate and month of grafting with favourable weather are mainly influencing graft success and growth under polyhouse condition. There is evidence that under such conditions callus growth is rapid and formation of vascular tissue is early. It was observed that graft success was high under polyhouse during the month of October with veneer method of grafting. These conditions provided the congenial atmosphere for rapid development of callus tissue and formation of vascular bundle resulting in higher graft success and growth in jackfruit.

47) “Studies on integrated weed management in cabbage (Brassica oleracea var.capitata L.)” - J.Suresh Kumar.

ABSTRACT

The “Studies on integrated weed management in cabbage (Brassica oleracea var. capitata L.)” was conducted at the Model orchard of College of Horticulture, Rajendranagar, Hyderabad during the year 2010-11. The study was carried out using cabbage cv. Golden Acre with 13 treatments viz., Pendimethalin C.S @ 0.7 kg a.i.ha$^{-1}$ + Propaquizafop @ 75 g a.i.ha$^{-1}$ (T$_1$), Pendimethalin C.S @ 0.7 kg a.i.ha$^{-1}$ + Hand weeding at 30 DAT (T$_2$), Pendimethalin C.S @ 0.7 kg a.i.ha$^{-1}$ + Black polythene mulch (T$_3$), Oxyfluorfen @ 0.25 kg a.i.ha$^{-1}$ + Propaquizafop @ 75 g a.i.ha$^{-1}$ (T$_4$), Oxyfluorfen @ 0.25 kg a.i.ha$^{-1}$ + Hand weeding at 30 DAT (T$_5$), Oxyfluorfen @ 0.25 kg a.i.ha$^{-1}$ + Black polythene mulch (T$_6$), Alachlor @ 1.0 kg a.i.ha$^{-1}$ + Propaquizafop @ 75 g a.i. ha$^{-1}$ (T$_7$), Alachlor @ 1.0 kg a.i.ha$^{-1}$ + Hand weeding at 30 DAT (T$_8$), Alachlor @ 1.0 kg a.i.ha$^{-1}$ + Black polythene mulch (T$_9$), Propaquizafop @ 75 g a.i.ha$^{-1}$ (T$_{10}$), Black polythene mulch (T$_{11}$), Hand weeding twice at 25 and 50 DAT (T$_{12}$) and Un-weeded control (T$_{13}$). The experiment was laid out in a randomized block design with three replications.

Among the different integrated weed management practices, significant differences in the plant characters like number of plants per hectare, height of plant, number of leaves per plant, initiation of head and 50 percent head initiation, number of days for first and final harvesting, fresh weight, dry weight and moisture content of cabbage head, length and diameter of cabbage head, yield per hectare were highest in the treatment Oxyfluorfen + Black polythene mulch.

Among the different integrated weed management practices, significant differences were recorded for weed parameters like weed population, weed dry weight and weed control efficiency. The treatment Oxyfluorfen + Black polythene mulch was significantly reduced the grasses and broad leaved weeds. Whereas, purple nut sedge was efficiently controlled by treatment T$_{12}$ - Hand weeding twice at 25 and 50 DAT. The less Weed Index was recorded in the treatment Oxyfluorfen + Black polythene mulch. Among the different integrated weed management practices maximum gross returns, net returns and B:C ratios were recorded in the treatment Oxyfluorfen + Black polythene mulch.
“Studies on the effect of holding solutions on vase life of cut gerbera (Gerbera jamesonii Bolus ex. Hook.) cv. Lamborgini” - M.R.Bhanu Sree

ABSTRACT

The present investigation entitled “Studies on the effect of holding solution on vase life of cut gerbera (Gerbera jamesonii Bolus ex. Hook.) cv. Lamborgini.” was carried out at Department of Horticulture, College of Horticulture, Venkataramannagudem, West Godavari District of Andhra Pradesh during October 2010 to January 2011. A total of four experiments were conducted and all the experiments were laid out in completely randomized design with factorial concept replicated thrice.

The first experiment consists of treatments with sucrose at different concentrations. The gerbera flowers held in sucrose 5% vase solution recorded higher values in water uptake (9.52 g/f), transpirational loss of water (9.31 g/f), water balance (4.21 g/f) and fresh weight of flowers (92.67%). The same treatment, however, recorded lower values in scape bending curvature (13.44 degrees), optical density (0.027) and electrolyte leakage (23.09%). Further, the cut flowers held in sucrose 5% vase solution recorded longer vase life (9.45 days) with higher total sugars (4.30 mg/g f wt) and non reducing sugars (2.10 mg/g f wt) contents.

The second experiment, consisted of treatments with different biocides (8-hydroxy quinoline sulphate, Sodium hypochlorite and calcium hypochlorite) at varied concentrations. The flowers maintained in vase solution containing 8-hydroxy quinoline sulphate (8- HQS) at 200 ppm recorded longer vase life (9.22 days) with higher values in water uptake (8.11 g/f), transpirational loss of water (8.29 g/f), water balance (3.82 g/f), fresh weight of flowers (95.63%), total sugars (3.91 mg/g f wt) and reducing sugars (2.51 mg/g f wt). The same treatment, however, recorded lower values in scape bending curvature (8.78 degrees), optical density (0.028) and electrolyte leakage (26.35%) which contributed to the longer vase life of cut flowers.

In the third experiment, the treatments were with different mineral salts (silver nitrate, aluminum sulphate, potassium chloride and calcium nitrate) at varied concentrations. The cut gerbera flowers with vase solution containing silver nitrate (AgNO₃) 20 ppm registered longer vase life (9.06 days) with higher values in water uptake (6.25 g/f), transpirational loss of water (6.66 g/f), fresh weight (85.24%), total sugars (3.60 mg/g f wt), reducing sugars (2.43 mg/g f wt) and non reducing sugars (1.17 mg/g f wt). The same treatment by recording lower values in scape bending curvature (10.48 degrees), optical density (0.016) and electrolyte leakage (24.54%) contributed to cut flower quality.

The fourth experiment consisted of treatments with a combination of best of biocides, mineral salts and sucrose (8-HQS 200 ppm, 8-HQS 300 ppm, silver nitrate 20 ppm, potassium chloride 200 ppm and sucrose 5%). The cut gerbera flowers held in vase solution containing a biocide, mineral salt and sucrose (8-HQS 200 ppm + AgNO₃ 20 ppm + sucrose 5%, respectively) registered longer vase life (12.22 days) by recording higher values in water uptake (9.86 g/f), transpirational loss of water (9.95 g/f), total sugars (4.43 mg/g f wt) and reducing sugars (2.86 mg/g f wt). The other factors contributed to the longer vase life of cut gerbera lowers with the treatment were lower values in scape bending curvature (1.62 degrees), optical density (0.012) and electrolyte leakage (22.52%).
ABSTRACT

An investigation was undertaken to ascertain the effect of packaging and ventilation on post-harvest shelf life and quality of sapota cv. Kalipatti comprising a set of three experiments, at Post Harvest Technology laboratory, College of Horticulture, Andhra Pradesh Horticultural University, Venkataramannagudem, West Godavari District, A.P.

The experiments include fruits of sapota cv. Kalipatti packed in LDPE bags of 100, 200 and 300 gauge with different ventilation of 0.8, 1.2 and 1.6 per cent ventilation stored at ambient, low temperature conditions and fruits treated with ethrel @ 1000 ppm uniformly packed and stored at ambient conditions.

Various physico-chemical parameters like PLW (%), Spoilage (%), Firmness (kg/cm\(^2\)), TSS (O\(\text{Brix}\)), Sugar (%), Acidity (%) and TSS: Acid ratio were estimated at an interval of 2, 5 and 2 days at room temperature, low temperature and ethrel treated fruits stored at ambient temperature respectively.

Fruits of control registered quicker ripening percentage, higher rate of PLW (%), early climacteric in all the three experiments. All these contributed to lower shelf life.

It was found that there was better retention of quality in terms TSS, Sugars, acidity and also lower PLW (%), ripening (%), spoilage (%), higher firmness (kg/cm\(^2\)) and shelf life in fruits stored at low temperature.

Fruits treated with ethrel had higher ripening (%), spoilage (%), higher TSS, ascorbic acid content, sugars (%) and lower firmness (kg/cm\(^2\)) compared to the fruits stored under ambient and low temperature.

Fruits packed in poly bags of 300 gauge with 0.8 per cent ventilation of recorded significantly lower PLW (%) in the first experiment and fruits packed in polybags of 200 gauge with 0.8 % ventilation recorded in the second and third experiments.

The fruits packed in polybags of 200 gauge with 1.2 % ventilation followed by fruits of 200 gauge with 0.8 and 1.6 % ventilation recorded significantly lowest ripening (%) and spoilage (%), higher firmness (kg/cm\(^2\)), TSS, ascorbic acid content, sugars (%) and lower TSS: Acid ratio in all the three experiments and were also organoleptically superior. The maximum shelf life of 13, 31.83, 11 days was recorded in fruits packed in 200 gauge LDPE with 1.2% ventilation in the ambient, low temperature and ethrel treated fruits respectively.

ABSTRACT

The present investigation entitled “Studies on the effect of chemicals and growth regulators on post harvest shelf life and quality of papaya (Carica papaya L.) Cultivar red lady” was carried out at College of Horticulture, Venkataramannagudem, West Godavari district of Andhra Pradesh. The study was carried out in two different experiments with 9 different treatments involving different combinations of calcium compounds in experiment I and growth regulators viz., GA\(_3\) and BA at different combinations in experiment II. Further, the experiments were conducted in a Completely Randomized Design (CRD) with three replications and data on effect of different chemicals and growth regulator treatments were recorded at every three days interval on physical parameters such as physiological loss in...
weight (PLW), ripening percentage, fruit firmness, disease occurrence, organoleptic scoring, shelf life and physico-chemical properties viz., Total Soluble Solids (TSS), Total sugars, reducing sugars, acidity, ascorbic acid and brix acid ratio.

The fruits treated with CaCl$_2$ @ 4% resulted in significantly lowest PLW, percentage of ripening, disease occurrence among the chemicals and Ca(NO$_3$)$_2$ @ 2% was found on par with CaCl$_2$ @ 4% whereas, GA$_3$ @ 100 ppm among the growth regulators resulted in lowest PLW, percentage of ripening, disease occurrence followed by BA @ 150 ppm which was on par with GA$_3$ @ 100 ppm. Highest physiological loss in weight (PLW), percentage of ripening and disease occurrence was observed in control where water treatment was imposed.

Significantly, highest fruit firmness, organoleptic scoring and highest shelf life was recorded for fruits treated with CaCl$_2$ @ 4% and fruits treated with Ca(NO$_3$)$_2$ @ 2% were found on par with CaCl$_2$ @ 4%. Similarly, fruits treated with GA$_3$ @ 100 ppm recorded highest fruit firmness, organoleptic scoring and highest shelf life and were on par with fruits treated with BA @ 150 ppm.

The fruits treated with CaCl$_2$ @ 4% was resulted in lowest total soluble solids (TSS), total sugars, reducing sugars and brix acid ratio among the chemicals and Ca(NO$_3$)$_2$ @ 2% was found on par with CaCl$_2$ @ 4% whereas, GA$_3$ @ 100 ppm among the growth regulators resulted in lowest total soluble solids (TSS), total sugars, reducing sugars and brix acid highest was recorded in BA @ 150 ppm. Untreated fruits resulted in highest total soluble solids (TSS), total sugars, reducing sugars and brix acid ratio in both the experiments.

Among the chemical treatments highest acidity and ascorbic acid was recorded with fruits treated with CaCl$_2$ @ 4% and fruits treated with Ca(NO$_3$)$_2$ @ 2% was found on a par with CaCl$_2$ @ 4%. Similarly, fruits treated with GA$_3$ @ 100 ppm recorded highest acidity and ascorbic acid and fruits treated with BA @ 150 ppm which was at par with GA$_3$ @ 100 ppm. Lowest acidity and ascorbic acid content was recorded in untreated fruits.

51) “Studies on the effect of organic and bionutrition on growth, yield and quality in Ashwagandha (Withania somnifera Dunal.)” - Ramadugu Praveen.

**ABSTRACT**

Studies on the “Effect of organic and bionutrition on growth, yield and quality in Ashwagandha (Withania somnifera Dunal.)” was conducted at College of Horticulture, Venkataramannagudem, West Godavari district of Andhra Pradesh during 2010-2011. The studies were carried out using ashwagandha cv. Poshita with 14 treatments viz., neem cake 4 t ha$^{-1}$ (NC 4 t ha$^{-1}$: T$_1$), vermicompost 5 t ha$^{-1}$ (VC 5 t ha$^{-1}$: T$_2$), poultry manure 5 t ha$^{-1}$ (PM 5 t ha$^{-1}$: T$_3$), farm yard manure 12 t ha$^{-1}$ (FYM 12 t ha$^{-1}$ : T$_4$), insitu green manuring with sunnhemp (GM : T$_5$), NC 4 t ha$^{-1}$ + BF (T$_6$), VC 5 t ha$^{-1}$ + BF (T$_7$), PM 5 t ha$^{-1}$ + BF (T$_8$), FYM 12 t ha$^{-1}$ + BF (T$_9$), GM + BF (T$_{10}$), bio-fertilizers consisting of Azospirillum and Phosphate solubilizing bacteria (BF: T$_{11}$), recommended dose of fertilizers (RDF : T$_{12}$), 50 per cent recommended dose of fertilizers (50 per cent RDF : T$_{13}$) and control (T$_{14}$). The experiment was laid out in a randomized block design with three replications.

Among the different treatments, PM 5 t ha$^{-1}$ + BF, VC 5 t ha$^{-1}$ + BF and RDF had recorded higher growth attributes viz., plant height, number of branches per plant, leaf area, LAI, dry matter production and AGR for plant height on par with each other and significantly higher than other treatments at all the growth stages studied except 30 DAS. The other yield attributes and yield viz., root length, root diameter, fresh root yield, dry root yield and seed yields recorded with PM 5 t ha$^{-1}$ + BF, VC 5 t ha$^{-1}$ + BF and RDF were also on par with each
other and significantly superior to other treatments indicating the potentiality of these treatments in enhancing ashwagandha root and seed yields.

The total alkaloid per cent recorded in ashwagandha root with the treatments, PM 5 t ha\(^{-1}\) + BF, VC 5 t ha\(^{-1}\) + BF and RDF was significantly higher over other treatments at harvest indicating the superiority of these treatments in enhancing the quality of produce. Among the treatments, application of PM 5 t ha\(^{-1}\) + BF, VC 5 t ha\(^{-1}\) + BF and RDF resulted in higher N P K uptake over other treatments in the experiment.

Among the different treatments, PM 5 t ha\(^{-1}\) + BF had recorded the highest gross income mainly on account of higher root and seed yield. The net income was, also, highest with PM 5 t ha\(^{-1}\) + BF owing to lower cost of cultivation and fair gross income. Further, the treatment, RDF recorded the highest BCR primarily on account of lower cost of cultivation and fair net income.

The treatments, PM 5 t ha\(^{-1}\) + BF and VC 5 t ha\(^{-1}\) + BF had recorded the growth, yield and quality attributes on par with RDF offering the scope for complete substitution of inorganic fertilizers with economic advantage over the other treatments with organic nutrient sources. Application of bio-fertilizers containing Azospirillum and PSB had resulted in growth, yield and quality attributes and nutrient uptake on par with 50 percent RDF offering the scope for reduction in inorganic fertilizers with increased soil health.

The present study clearly indicated that PM 5 t ha\(^{-1}\) + BF, VC 5 t ha\(^{-1}\) + BF and RDF were superior to other treatments in respect of root yield and quality with overall better performance. However, the treatment, PM 5 t ha\(^{-1}\) + BF with more economic advantage over can be recommended for obtaining higher yields in ashwagandha. Further for complete substitution of inorganic fertilizers, the treatment, PM 5 t ha\(^{-1}\) + BF can be recommended.


ABSTRACT

The research work entitled “Studies on the effect of modified atmosphere packing on shelf life of banana Cv. Grand Naine.” was conducted at fruit Research station, Sangareddy, Medak during the year 2010-11. It consists a set of two experiments involving different levels of perforation (0.5 mm) treatments.

Both the experiments were carried out in CRD with factorial concept with eight treatments and replicated thrice. Physico-chemical characters were recorded at specific day intervals to study the shelf life of banana fruit under ambient conditions and cold room conditions with different perforation levels.

The fruits were packed in poly propylene bags with 5 Pores, 10 Pores, 15 Pores, 20 Pores, 25 Pores, 30 Pores, without Pores and unwrapped control and kept under ambient storage conditions in the first experiment and in cold room condition in the second experiment.

It was observed that the physiological loss in weight, colour index, spoilage rates increased and fruit firmness decreased in all the experiments irrespective of the treatments with the advancement of duration. Total Soluble Solids, reducing sugars and total sugars increased initially and then decreased towards the end of the storage period.

Irrespective of storage conditions, the banana Cv. Grand Naine fruits packed in polypropylene with 5 Pores registered the highest firmness, Total soluble solids, ascorbic acid, reducing sugars, total sugars which coupled with lowest physiological loss in weight, colour
index and spoilage which contributed highest shelf life. This was followed by fruits packed in polypropylene bag with 10 pores.

The shelf life of fruits packed in polypropylene bag with 5 pores can be extended successfully for about 11 days at ambient condition and 22 days at cold room conditions respectively.


ABSTRACT

Studies on “Effect of plant growth retardants, growth regulators and spacing on vegetative growth and flower yield of African marigold (Tagetes erecta L.) cv. Pusa Narangi Gainda” was conducted at Horticultural Research Station, College of Horticulture, Venkataramannagudem, Tadepalligudem, West Godavari during 2010-11. The study was carried out with two experiments.

Expt-I: To study the effect of two spacings 30 x 20 cm and 40 x 20 cm and also the effect of exogenously applied growth regulators i.e. GA₃, NAA and Ethrel at concentrations, 250 ppm 350 ppm, and 450 ppm respectively on growth and flower yield in African marigold cv. Pusa Narangi Gainda with 20 treatments replicated thrice in RBD with factorial concept.

Expt-II - To study the effect of two spacings 30 x 20 cm and 40 x 20 cm and also the effect of exogenously applied Plant growth retardants i.e. MH, CCC and TIBA at concentrations of 750 ppm, 1000 ppm and 1250 ppm respectively on growth and flower yield in African marigold cv. Pusa Narangi Gainda with 20 treatments replicated thrice in RBD with factorial concept.

Among the growth regulators studied, GA₃ and NAA had promotive effect on vegetative characters like plant height and internodal length. Ethrel suppressed plant height, internodal length and enhanced plant spread and number of laterals.

GA₃ at 350 ppm advanced flowering, increased flower weight, flower size and flower yield. Ethrel at 350 ppm increased number of flowers per plant and reduced flower size and flower weight.

Among the growth retardants studied, CCC, TIBA and MH suppressed plant height, internodal length and enhanced the plant spread, number of laterals over control. MH at 1250 ppm enhanced number of flowers and CCC at 750 ppm recorded maximum flower yield per plant and hectare. TIBA at 1000 ppm recorded maximum flower size, flower weight.

Among the spacings studied, 40 x 20 cm reduced plant height, internodal length and enhanced plant spread, number of laterals and enhanced the floral characters i.e. number of flowers, flower size, flower weight and flower yield per plant. Spacing 30 x 20 cm enhanced plant height, advanced flower initiation and increased flower yield per hectare due to increased plant population per unit area. The treatment combination of Ethrel at 250 ppm with 30 x 20 cm spacing recorded more flower yield per hectare.

**ABSTRACT**

The present investigation entitled “STUDIES ON THE EFFECT OF SOWING DATES AND SPACING ON GROWTH AND ROOT YIELD OF RADISH (*Raphanus sativus* L.) cv. PUSA CHETKI” was carried out in Rabi 2010-2011 at College of Horticulture, Venkataramannagudem, Andhra Pradesh Horticultural University, West Godavari (Dist.).

Present study includes 12 treatments each replicated thrice in Factorial Randomized Block Design. The treatments included four levels of sowing dates (1<sup>st</sup> October, 15<sup>th</sup> October, 1<sup>st</sup> November and 15<sup>th</sup> November) and three levels of spacing (45x10 cm, 45x20 cm and 45x30 cm).

The results revealed that the radish cv. Pusa Chetki responded well to sowing dates as well as plant spacing. The vegetative parameter like plant height was favorably influenced by sowing date D<sub>1</sub> (1<sup>st</sup> October) and a plant spacing of 45x10 cm (S<sub>1</sub>). Whereas, others like days to germination, germination percentage, number of leaves per plant (15, 30, 45 and 60 DAS), leaf area (at 30, 45 and 60 DAS), root-shoot ratio (at 60 DAS) and plant weight (60 DAS) were recorded maximum with sowing date D<sub>1</sub> (1<sup>st</sup> October) and plant spacing S<sub>3</sub> (45x30 cm). The number of days taken to root maturity was found to be minimum with the delayed sowing i.e., (D<sub>4</sub>-15<sup>th</sup> November) and closer spacing i.e., (S<sub>1</sub>-45x10 cm).

The yield and yield attributing characters like root length, root yield plot<sup>1</sup> and root yield ha<sup>-1</sup> showed better expression with early sowing (D<sub>1</sub>-1<sup>st</sup> October) and closer spacing (S<sub>1</sub>-45x10 cm). However, the root girth and root weight were found significantly superior with the early sowing (D<sub>1</sub>-1<sup>st</sup> October) and wider spacing (S<sub>3</sub>-45x30 cm). Physiological disorders like cracking, splitting and root forking were found to be maximum with the delayed sowing (D<sub>4</sub>-15<sup>th</sup> November) and closer spacing (S<sub>1</sub>-45x10 cm).

The interaction effect of sowing dates and spacing were found non-significant with plant height (at 15, 30 and 60 DAS), leaf area at (15 DAS), root-shoot ratio at (15, 30 and 45 DAS), root length (at 15, 30, 45 and 60 DAS), days to maturity and disorders like cracking and splitting. Significant differences were observed in days to germination, germination percentage, plant height (at 45 days) and root yield ha<sup>-1</sup> with the treatmental combination of (D<sub>1</sub>-1<sup>st</sup> October + S<sub>1</sub>-45x10 cm). However, number of leaves (15, 30, 45 and 60 DAS), leaf area (at 30, 45 and 60 DAS), root-shoot ratio at (60 DAS), plant weight (at 60 DAS), root girth and root weight (at 60 DAS) were found to be significant with treatmental combination of (D<sub>1</sub>-1<sup>st</sup> October + S<sub>3</sub>-45x30 cm). The maximum root forking was observed with treatmental combination of (D<sub>4</sub>-15<sup>th</sup> November + S<sub>1</sub>-45x10 cm).

55) “Studies on influence of calcium nitrate and mulches on growth and development of chrysanthemum (*Dendranthema grandiflora* L.)” - B.Indira

**ABSTRACT**

A field experiment, “Studies on influence of calcium nitrate and mulches on growth and development of chrysanthemum (*Dendranthema grandiflora* L.)” was conducted at All India Coordinated Research Project on Floriculture, College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2010-11. This main experiment had two sub experiments. The first experiment was Studies on the influence of inorganic mulches and foliar spray of calcium nitrate on growth, flower yield and vase life of chrysanthemum. This experiment had 10 treatments. T<sub>1</sub> - Control: no
mulch + CaNo₃ 3% spray, T₂ - Coir pith (check) T₃ - Black polythene mulch 25 micron, T₄ - Black polythene mulch 25 micron + CaNo₃ 3% spray, T₅ - Black polythene mulch 50 micron, T₆ - Black polythene mulch 50 micron + CaNo₃ 3% spray, T₇ - White polythene mulch 25 micron, T₈ - White polythene mulch 25 micron + CaNo₃ 3% spray, T₉ - White polythene mulch 50 micron, T₁₀ - White polythene mulch 50 micron + CaNo₃ 3% spray. The second experiment was Studies on the influence of organic mulches and foliar spray of calcium nitrate on growth, flower yield and vase life of chrysanthemum. This experiment also had 10 treatments. T₁ - Control: no mulch + CaNo₃ 3% spray, T₂ - Black polythene mulch 25 micron (check), T₃ - Coir pith mulch, T₄ - Coir pith mulch + CaNo₃ 3% spray, T₅ - Dried leaf mulch, T₆ - Dried leaf mulch + CaNo₃ 3% spray, T₇ - Coconut frond mulch, T₈ - Coconut frond mulch + CaNo₃ 3% spray, T₉ - Paddy straw mulch, T₁₀ - Paddy straw mulch + CaNo₃ 3% spray. The entire treatments were replicated thrice. In both experiment the treatments were laid out in randomized block design.

The results of the first experiment revealed that black polythene mulch of 50µ (T₅) and black polythene mulch of 50µ plus 3% CaNO₃ spray (T₆) treatments were superior over other treatments in most of the parameters studied. Black polythene mulch of 50µ plus 3% CaNO₃ spray (T₆) showed superiority in plant height, number of branches, plant spread, flower diameter, mean flower weight, number of flowers per plant, yield per plant, yield per plot, yield per hectare and vase life. Weed control efficiency and soil temperature was also recorded height under this treatment (T₆). The major and secondary nutrients content were also maximum in plants of these treatment.

On the other hand, early flower bud initiation was observed in both white and black polythene of 50µ mulched plots without CaNO₃ spray (i.e. T₅ and T₇) and 50% flowering was noticed early in black polythene (50µ) mulched plot alone.

The results of the second experiment disclosed that plants in black polythene mulch of 25µ (T₂) and coconut frond mulch with 3% CaNO₃ spray (T₈) showed transdency over other treatments in most of the parameters. Black polythene mulch of 25µ (T₈) recorded highest plant height, number of branches, plant spread, mean flower weight, number of flowers per plant, yield per plant, yield per plot and yield per hectare.

Plants in coconut frond mulch and 3% CaNO₃ spray (T₈) have taken minimum days for flower bud initiation and 50% flowering. Flower diameter, vase life, nitrogen and calcium content (both at 60 DAT and at harvest) were maximum in this treatment, whereas height soil moisture was recorded under coconut frond mulched plot and coconut frond mulch plus 3% CaNO₃ sprayed (T₈) plot at 50 cm depth. Regarding Phosphorus and potassium accumulation in plants, it was recorded maximum in plants of coconut frond mulch plus 3% CaNO₃ foliar sprayed treatment (T₈).

56) “Studies on the synergistic effects of antioxidants and modified atmosphere packaging on chilling injury and storage life of papaya cv. red lady”- R.Vijay Kumar.

**ABSTRACT**

A set of three experiments on the effects of modified atmosphere packaging (fruits packed in polypropylene bags with 3% O₂ + 5% CO₂ or 3% O₂ + 10% CO₂ or 5% O₂ + 5% CO₂ or 5% O₂ + 10% CO₂ or vacuum), antioxidants (benzyl adenine 50, 100 ppm or sodium benzoate and ascorbic acid of 500, 1000 ppm) and combination of MAP (first two best of MAP) and antioxidants (three best of antioxidants) on chilling injury and storage life of papaya cv. Red Lady stored at 10 ± 1º C conducted at Fruit Research Station, Sangareddy, Medak District, Andhra Pradesh. In all the experiments, the design followed is Completely Randomized Design with Factorial concept with three replications per treatment. Various
physical parameters like PLW (%), fruit firmness (kg cm^{-2}), chilling injury (rotting, skin scald), shelf life (in days), ripening (in days), organoleptic evaluation and color of the fruit and biochemical parameters like TSS (°Brix), titrable acidity (%), ascorbic acid (mg/100g), electrolyte leakage (%), brix-acid ratio and respiration rate (ml CO_{2} kg^{-1} hr^{-1}) were estimated at an interval of 5 days during storage in all the experiments.

Papaya fruits cv. Red Lady were packed in polypropylene bags with different concentrations of O_{2} + CO_{2} or vacuum and stored at 10 ± 1º C. Fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2} significantly recorded lowest PLW. Significantly highest fruit firmness and organoleptic evaluation were recorded in fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2}. Significantly lowest chilling injury was recorded in fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2} and correspondingly increased the shelf life upto 25.00 days. The fruits kept under control recorded a shelf life of 15.35 days only. Biochemical parameters like electrolyte leakage, titrable acidity and respiration rate were significantly lowest in fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2}. Fruits packed in polypropylene bags with 3 % O_{2} + 10 % CO_{2} recorded significantly highest TSS and brix-acid ratio. Significantly highest ascorbic acid was recorded with the fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2}.

Papaya fruits cv. Red Lady were dipped in different concentrations of antioxidants and stored at 10 ± 1º C. Fruits treated with benzyl adenine 50 ppm recorded significantly lowest PLW, ripening and highest fruit firmness, organoleptic evaluation and color. Significantly lowest chilling injury was recorded in the fruits treated either with benzyl adenine 50 ppm or sodium benzoate 500 ppm and correspondingly increased the shelf life upto 25.00, 24.42 days respectively. The fruits kept under control recorded the shelf life upto 15.72 days only. Biochemical parameters like titrable acidity, electrolyte leakage and respiration rate were significantly lowest in the fruits treated with benzyl adenine 50 ppm. Significantly highest TSS and brix-acid ratio were recorded in fruits treated with benzyl adenine 50 ppm. Significantly highest ascorbic acid was recorded with either benzyl adenine 50 ppm or ascorbic acid 1000 ppm.

Papaya fruits cv. Red Lady were treated with three best antioxidants (benzyl adenine 50 ppm or sodium benzoate 500 ppm or ascorbic acid 500 ppm) and then packed in two best treatments of MAP (fruits packed in polypropylene bags with 5 % O_{2} + 5 % CO_{2} or 3 % O_{2} + 10 % CO_{2}) and stored at 10 ± 1º C. The combination treatments of fruits packed in polypropylene bags either with 3 % O_{2} + 10 % CO_{2} + benzyl adenine 50 ppm or 3 % O_{2} + 10 % CO_{2} + sodium benzoate 500 ppm or 3 % O_{2} + 10 % CO_{2} + ascorbic acid 500 ppm recorded significantly lowest chilling injury correspondingly increased the shelf life upto 29.46, 29.33 and 28.75 days respectively. The combination treatments of fruits packed in polypropylene bags with 3 % O_{2} + 10 % CO_{2} + benzyl adenine 50 ppm recorded significantly lowest ripening, highest fruit firmness and highest organoleptic evaluation. Significantly lowest PLW was recorded with fruits packed in polypropylene bags either with 3 % O_{2} + 10 % CO_{2} + ascorbic acid 500 ppm or 5 % O_{2} + 5 % CO_{2} + sodium benzoate 500 ppm. Biochemical parameters like highest TSS, highest ascorbic acid, lowest electrolyte leakage and lowest respiration rates were recorded with the fruits packed in polypropylene bags with 3 % O_{2} + 10 % CO_{2} + benzyl adenine 50 ppm. Significantly lowest titrable acidity was recorded with the fruits packed in polypropylene bags either with 3 % O_{2} + 10 % CO_{2} + benzyl adenine 50 ppm or 5 % O_{2} + 5 % CO_{2} + sodium benzoate 500 ppm. Significantly highest brix-acid ratio was recorded with the fruits packed in polypropylene bags with 3 % O_{2} + 10 % CO_{2} + benzyl adenine 50 ppm. The combination of MAP and antioxidants enhanced the shelf life of 4.17 and 4.46 days over the MAP or antioxidants used alone, respectively.
57) “Genetic divergence studies in dolichos bean (Dolichos lablab L var.typicus prain)”
- Chaitanya Vanam.

ABSTRACT

A field experiment was conducted to estimate the genetic variability and genetic
divergence in dolichos bean and to carry out yield component analysis through correlation and
path analysis. Forty five local genotypes along with three checks were sown in a randomized
block design with three replications, during rabi 2010-2011 at NBPGR Regional Station,
Hyderabad. The objective of the experiment was to identify divergent genotypes to be used as
donor parents in hybridization programmes.

The analysis of variance revealed significant differences between genotypes indicating
presence of sufficient amount of variability in all the characters studied. Wide range of
variability was observed for plant height, marketable pod yield per plant and number of pods
per plant indicating the scope for selection of suitable initial breeding material for further
improvement.

On the basis of the mean performance of the genotypes among traits studied, the
following were identified as promising lines for further crop improvement in dolichos bean
viz., RJR-150, PSRJ-13008, JBT-38/36 and NSJ-169.

GA as percent of mean, GCV and PCV values was on par with each other for most of
the characters which indicated that the influence of the environment on the trait(s) was very
negligible. The values observed were not confounding with the environment. It is a true
reflection of the homeostasis effect or buffer reaction of the gene. Thus, the true reflection of
the trait is exhibited.

A true agreement with the GCV and PCV values in the present investigation for the 19
characters was noticed, indicating additive genetic variance governing the high heritability with
 genetic advance as percent of mean. Thus, a breeder can employ a simple selection process
which will be a rewarding one to improve the characters viz., plant height (cm), number of
primary branches per plant, days to first flowering, days to 50 per cent flowering, length of
inflorescence (cm), internode length (cm), number of flowers per inflorescence, number of
pods per inflorescence, days to last pod harvest, pod length (cm), pod weight (g), number of
pods per plant, 100 seed weight (g), protein content (%) and marketable pod yield per plant (g).
For days to first pod harvest, pod length and number of seeds per pod, moderate heritability
with high GA as per cent of mean indicates non additive action controlling the traits.

By Mahalanobis’ D² statistic, it could be inferred that protein content, followed by
number of flowers per inflorescence, pod length, number of pods per plant, marketable pod
yield per plant and number of pods per inflorescence contributed maximum towards genetic
divergence.

The D² analysis was carried out for 19 characters which partitioned the forty eight
genotypes into eight clusters. Maximum divergence was observed between cluster IV and VI,
while minimum was between cluster IV and I. The maximum intra cluster distance was shown
by cluster V. The clusters showing high genetic divergence could be effectively utilized in
heterosis breeding programme.

From correlation studies it was observed that marketable pod yield per plant has
exhibited highly significant positive association with number of pods per plant followed by
days to last pod harvest, pod weight, protein content, pod length, pod width, pod weight and
number seeds per pod.
Path analysis revealed that maximum positive direct effect on marketable pod yield per plant was exhibited through number of pods per plant followed by high positive direct effect of pod weight, moderate positive direct effect of days to 50 per cent flowering. Pod weight and number of seeds per pod exhibited low positive direct effect on marketable pod yield per plant.

Dolichos bean genotypes exhibited high variability for all the qualitative traits viz., plant growth characters, leaf characters, flower characters, pod characters, pod characters and seed characters. Therefore, it is emphasized to lay attention on the traits viz., number of pods per plant, pod weight, days to last pod harvest, pod length and protein content in crop improvement programme of dolichos bean in future.

58)“ Studies on genetic diversity in muskmelon (Cucumis melo L.)” - B.Praveen Kumar Reddy

ABSTRACT

A set of thirty five genotypes of muskmelon (Cucumis melo L.) were characterized and evaluated in a randomized block design with three replications at VRS, ARI, Rajendranagar during rabi 2010-2011 with an objective of studying genetic variability, genetic diversity, character association and contribution.

The analysis of variance revealed significant differences for all the eighteen characters under study suggesting considerable amount of variability exists among the genotypes. On the basis of mean performance the genotypes RNMM-31, RNMM-32, RNMM-3 and RNMM-12 were found to be superior for majority of the yield and fruit quality attributes which can be used as parental source in breeding programmes.

Multivariate analysis following Mahalanobis $D^2$ statistic revealed distinct clustering pattern and considerable genetic diversity within and between clusters. The selection and involvement of the horticulturally superior and genetically divergent genotypes from the divergent clusters (cluster I and VI) is expected to give high heterosis and throw more useful segregants. The characters TSS, seed yield, days to appearance of first staminate flower, average fruit weight and fruit cavity length contributed greatly towards diversity.

From the coefficient of variation, it is evident that the estimates of phenotypic coefficients of variation were higher than the corresponding genotypic coefficients of variation for all the eighteen growth, earliness, fruit yield and quality attributes indicating the greater influence of environment on the expression of these genotypes. The estimates of genotypic and phenotypic coefficient of variation for average fruit weight, number of fruits per vine, fruit cavity length, rind thickness, seed yield per fruit and fruit yield per plant were high (>20%) indicating that the variability observed in 35 genotypes of muskmelon is high offering ample scope for selection for these traits.

Days to appearance of first staminate flower, fruit length, average fruit weight, fruit cavity length, fruit cavity width, rind thickness, TSS and seed yield having high heritability (>60%) accompanied with high genetic advance over percent of mean (>20%), indicating that most likely the heritability is due to additive gene action and the chances of fixing by selection are more to improve these traits.

From the association analysis, it is evident that the characters vine length, number of primary branches per vine, fruit length, fruit diameter, average fruit weight, number of fruits per vine, fruit cavity length, fruit cavity width, rind thickness and seed yield had positively significant association with fruit yield per plant in muskmelon.

Path coefficient revealed high (>0.3) positive direct effect of days appearance first pistillate flower, node number of first pistillate flower, fruit diameter, average fruit weight,
number fruits per vine, rind thickness, TSS and seed yield and high negative direct of number of primary branches per vine, days appearance first staminate flower, days to first fruit harvest, days to last fruit harvest, fruit cavity length and width and pulp thickness on fruit yield per plant in muskmelon.

In conclusion, the present investigation revealed that the horticulturally superior genotypes viz., RNMM-31, 32, 3 and 12 are selected, on the basis of the characters having high heritability, high genetic advance as percent of mean and strong association and high direct effect on fruit yield viz., days appearance first staminate flower, average fruit weight, fruit cavity length and width, rind thickness and seed yield per fruit. Following any one the methods like synthetic breeding, composite breeding and population improvement by recurrent selection for gca can help in the genetic improvement of yield in muskmelon.


**ABSTRACT**

The present investigation entitled “Effect of integrated nutrient management on growth, yield and quality of elephant foot yam [Amorphophallus paeonifolius (Dennst.)] Var. Gajendra” was carried out during the kharif season of 2010-2011 at Horticultural Research Station, Kovvur, West Godavari district of Andhra Pradesh. The studies were carried out with 10 different INM treatments involving different combinations of 100% recommended dose of fertilizers, 75% and 50% dose of inorganic fertilizers along with organic manures viz., farm yard manure, bio-fertilizers (Azospirillum, PSB, AMF) and bioagents such as Pseudomonas and Trichoderma. Further, the experiments were laid out in a randomized block design (RBD) with three replications and data on effect of different INM treatments on growth, dry matter production, yield, yield attributes, quality, nutrient uptake, residual fertility and economics of cultivation were recorded and statistically analyzed.

The application of 75% RDF through inorganic fertilizers and 25 % RDF through organic source (FYM) along with AMF @ 5 kg ha$^{-1}$ and Azospirillum @ 5 kg ha$^{-1}$ (T$_4$) had resulted in maximum plant height and highest dry matter production, canopy spread, nitrogen and potassium uptake at all the growth stages whereas, 75% RDF through IOS and 25 % RDF through FYM in conjunction with PSB @ 5 kg ha$^{-1}$ and Azospirillum @ 5 kg ha$^{-1}$ resulted in highest uptake of P. Further, psuedostem girth was recorded maximum with 100 % RDF at all the growth stages.

Highest yield per hectare and yield attributes viz., single corm weight, volume and diameter of the corm were recorded with 75% RDF through (IOS) and 25 % RDF through FYM in combination with AMF and Azospirillum (T$_4$) and the treatments 100 % RDF (T$_9$) and T$_3$, T$_5$ which are the combinations of 75 % RDF (IOS) and 25 % RDF (FYM) along with PSB and Azospirillum and 75 % RDF (IOS), 25 % RDF (OS- FYM) in conjunction with Pseudomonas and Trichoderma were statistically found at par with T$_4$.

The quality attributes viz., moisture percentage, total sugars, phenols and β-carotene were found non significant irrespective of the INM treatments imposed whereas, significantly lowest calcium oxalates were found with the control where no inorganic fertilizers were applied. Increase in the N content supplied through the inorganic fertilizers results in the accumulation of more oxalates. In contrast, highest starch and total soluble proteins were recorded with the T$_4$ which is the combination of 75 % RDF (IOS) + 25 % RDF (OS- FYM) + AMF + Azospirillum and the treatments 100 % RDF (T$_9$) and T$_3$ [(75 % RDF (IOS) + 25 % RDF (OS- FYM) + PSB + Azospirillum] and , T$_5$ [75 % RDF (IOS) + 25 % RDF (OS- FYM) + Pseudomonas + Trichoderma ] were statistically found at par with T$_4$. 

...
Highest residual fertility of N, P and K were recorded with 75% RDF through IOS and 25% RDF through FYM (T8) whereas, 75% RDF (IOS) + 25% RDF (OS- FYM) + PSB + Azospirillum and 75% RDF (IOS) + 25% RDF (OS- FYM) + AMF + Azospirillum were found statistically on a par with T8 with respect to the residual fertility.

The different INM treatments were also observed to profoundly influence the gross and net returns in addition to benefit: cost ratio of Amorphophallus cultivation. The treatment 75% RDF (IOS) and 25% RDF (OS- FYM) along with AMF and Azospirillum resulted in highest benefit cost ratio of 3.84 followed by the treatments 75% RDF (IOS) + 25% RDF (OS- FYM) + PSB + Azospirillum (T3) and 75% RDF (IOS) + 25% RDF (OS- FYM) + Pseudomonas + Trichoderma (T5).

60) “Post harvest studies in banana cv. grand naine” - Ram Mohan K

ABSTRACT

With the objectives of extending the shelf life and assessing the quality changes (physical and chemical) of banana fruits cv. Grand Naine, Three experiments were conducted using packaging material (150, 200, 250 and 300 gauge with 0.5 and 1% vents), fruit coating material (4%, 6% and 8% wax), packaging, fruit coating material along with growth regulator (GA3 150 ppm) and Antioxidants (Sodium benzoate 500 ppm and Benzyl adenine 50 ppm) at laboratory department of Horticulture, APHU, College of Horticulture, Rajendranagar, Hyderabad during year 2010-11. In all the experiments the design followed is completely randomized design. Various physico-chemical parameters like PLW (%), pulp to peel ratio, fruit firmness (kg/cm²), colour development, spoilage (%), TSS (°B), sugars(total and reducing) (%), acidity (%), ascorbic acid content (mg/100 g) and shelf-life(days) were estimated at an interval of 3 days. Fruits packed in polythene covers of 300 gauge with 1% vents recorded significantly lower PLW (%); pulp to peel ratio, spoilage (%), TSS (°B) and sugars (%) (Reducing and total). Significantly higher firmness (kg / cm²), good colour development, acidity (%), ascorbic acid content (mg/100 g) and correspondingly increased the shelf life upto 18.19 days. The fruits kept under control recorded the shelf life upto 8.86 days only.

Banana fruits cv. Grand Naine was dipped in different percentage of wax (4%, 6% and 8%). Fruits treated with 8% wax recorded significantly lowest PLW (%), pulp to peel ratio, spoilage (%), TSS (°B) and sugars (reducing and total). Significantly higher firmness (kg / cm²), good colour development, acidity (%), ascorbic acid content (mg/100 g) and correspondingly increased the shelf life upto 15.21 days. The fruits kept under control recorded the shelf life upto 8.64 days only.

Banana fruits cv. Grand Naine were treated with growth regulator (GA3 150 ppm) and Antioxidants (BA 50 ppm and sodium benzoate 500 ppm), best treatment of experiment-2 (8% wax) and then packed in best treatment of experiment-1 (300 gauge + % vent). The combination treatments of fruits packed in 300 gauge with 1% vent treats with GA3 150 ppm + 8% wax recorded significantly lowest PLW (%), pulp to peel ratio, spoilage (%), TSS (°B) and sugars (reducing and total). Significantly higher firmness (kg/cm²), good colour development, acidity (%), ascorbic acid content (mg / 100 g) and correspondingly increased the shelf life upto 21.41 days.
“Effect of growth regulators on shelf life of sweet orange cv. Sathgudi”- V. Hemalatha.

ABSTRACT

The present investigation entitled “Effect of Growth regulators on Shelf-life of Sweet orange Cv. Sathgudi” was carried out in the Post Harvest Technology Laboratory, College of Horticulture and Quality Control Laboratory (ANGRAU), Rajendranagar during the year 2010. Effect of growth regulators with wax on shelf life of sweet orange was observed at ambient and low temperature.

Two experiments were conducted in CRBD with factorial concept and the treatments were replicated four times. The fruits were treated with 2,4-D 500 ppm + Wax 6 %, GA3 500 ppm + Wax 6 %, BA 50 ppm + Wax 6 % and Wax 6 %. Physico-chemical characters were recorded at 5 days interval at ambient condition and at 15 days interval at low temperature.

It was observed that the physiological loss in weight, colour index, spoilage rates increased while the juice content, peel content, peel thickness and fruit firmness decreased irrespective of the treatments and storage with the advancement of duration. Total Soluble Solids, reducing, total and non-reducing sugars, acidity, ascorbic acid, organoleptic evaluation decreased whereas pH increased towards the end of the storage period.

In the first experiment lower PLW (13.33 %), spoilage (2.78 %), pH (3.50) and high juice content (42.07 %), peel content (23.53 %), peel thickness (2.00 mm), firmness (6.20 kg/cm²), reducing sugars (3.24 %), ascorbic acid (48.68 mg/100ml of juice) and organoleptic score (2.42) was observed with BA 50 ppm + Wax 6 % upto 25 days of storage. However, shelf life as per organoleptic evaluation was found to be up to 15 days.

Lowest colour index value (2.34) and high total (6.76 %) and non-reducing sugars (3.56 %) was observed in 2,4-D 500 ppm + Wax 6 % whereas high TSS (10.18 °B) and titrable acidity (0.87 %) was observed in GA3 500ppm + Wax 6 %.

At low temperature less PLW (6.61 %), spoilage (2.67 %), pH (3.57) and high juice (43.54 %) and peel content (24.65 %), peel thickness (2.16mm), firmness (6.52 kg/cm²), TSS (10.54 °B), reducing sugars (3.42 %), total sugars (7.06 %), non-reducing sugars (3.64 %), acidity (0.83 %), ascorbic acid (51.89mg/100ml of juice) and organoleptic score (2.50) was observed with BA 50 ppm + Wax 6 % upto 120 days of storage. However, colour index value was found to be lowest in GA3 500 ppm + Wax6% (3.82) treated fruits.

“Studies on the effect of integrated nutrient management practices on growth, leaf yield and quality of palak (Beta vulgaris var. bengalensis hort.)” - Perapogu Vinod Kumar

ABSTRACT

The present investigation entitled “Studies on the effect of Integrated Nutrient Management practices on growth, leaf yield and quality of palak” (Beta vulgaris var. bengalensis Hort.) was carried out during the rabi season of 2010-2011 at the college farm of College of Horticulture, Venkataramannagudem, West Godavari district of Andhra Pradesh. The studies were carried out with 11 different INM treatments involving 100% recommended dose of nutrients through inorganic and organic, integrated treatments of 75%, 50% and 25% of recommended dose of inorganic fertilizers along with 25%, 50% and 75% organic manures viz., vermicompost, farm yard manure, and poultry manure and bio-fertilizers (Azospirillum@5kg/ha⁻¹, PSB@ 2 kg/ha⁻¹). Further, the experiment was laid out in a
randomized block design (RBD) with three replications and data on effect of different INM treatments on growth, production, yield, quality, nutrient uptake and economics of cultivation were recorded and statistically analyzed.

The application of 100% RDF through inorganic (T$_{11}$) was best and it was on par with 75% RDF through inorganic fertilizers + 25% RDN through organic source (poultry manure and vermicompost) along with bio-fertilizers Azospirillum @ 5 kg ha$^{-1}$and PSB @ 2kg ha$^{-1}$ (T$_{3}$ and T$_{1}$) in maximum plant height, number of leaves, leaf area per plant, fresh weight of leaf, dry weight of leaf, leaf dry matter production, nitrogen and potassium and phosphorus uptake. Highest yield per hectare was recorded with100% RDF through inorganic (T$_{11}$) which was on par with 75% RDF through (IOS) + 25 % RDN through poultry manure and vermicompost in combination with bio-fertilizers.

The highest quality attributes viz., protein and chlorophyll were recorded with100% RDF and it was on par with 75% RDF through (IOS) + 25 % RDN through poultry manure and vermicompost in combination with bio-fertilizers. Highest ascorbic content was recorded with application of 75% RDF through (IOS) + 25 % RDN through poultry manure. The different INM treatments were also observed to profoundly influence the gross and net returns of palak cv. ArkaAnupama cultivation. The treatment 100% RDF through inorganic (T$_{11}$) recorded highest benefit-cost ratio of 2.52 followed by 75 % RDF (IOS) + 25 % RDN through poultry manure along with bio-fertilizers (T$_{3}$).

63) “Characterization and evaluation of brinjal genotypes (Solanum melongena L)” - K.Chandra Sekhar.

ABSTRACT

Characterization for qualitative and evaluation for quantitative characters, genetic variability, heritability, genetic advance and direct and indirect effects of various components on yield in 31 germplasm accessions of brinjal (Solanum melongena L.) were evaluated in a Randomized Block design with three replications at College of Horticulture and Research Institute, Venkataramannagudem during Kharif 2009-2010.

Among the 31 brinjal genotypes the frequency of qualitative characters like plant growth habit in which upright plants were dominant, followed by intermediate, in leaf blade lobbing, intermediate group were dominant, in leaf prickles, none group was dominant, in corolla colour, pale violet was dominant, in fruit curvature, none fruit genotype was dominant, in fruit apex shape, protruded fruit genotypes were dominant, in fruit colour at commercial ripeness, purple black was dominant.

The analysis of variance of RBD revealed highly significant differences among the genotypes for all the 14 characters studied. The values of PCV and GCV for all the traits except for plant height, number of branches per plant, days to first flowering, days to first picking, average fruit weight and total number of harvests, indicating the less influence of environment consequently more scope for their improvement through selection.

High heritability and genetic advance over mean were recorded for all the characters (except plant height and average fruit weight) indicating that the characters were least influenced by the environmental effects, but the selection for the improvement of such characters may not be useful, because broad sense heritability is based on genetic variance which includes both fixable (additive) and non fixable (dominance and epistatic) variances.

Correlation coefficient analysis revealed highly significant positive association of number of leaves per plant, number of fruits per plant, average fruit weight and total number of harvests with fruit yield per plant and thus these characters were identified as component characters on which selection can be relied upon for genetic improvement of brinjal.
Path analysis revealed that number of fruits per plant and average fruit weight had high positive direct effect on fruit yield per plant. While the remaining characters had negligible to low indirect effect through other component characters. Therefore, number of fruits per plant and average fruit weight are the reliable characters for the improvement of the fruit yield. The residual effect, if it is high, some other factors which have not been considered here need to be included in this analysis to account fully for the variation in yield.

The mean performance of genotypes indicated that the genotypes IC-111444, IC-136088, IC-111387 and IC-111404 were found to be elite for days to first flowering, days to first picking, plant height, number of fruits per plant, fruit yield per plant, average fruit length, average fruit weight and average fruit diameter respectively in brinjal.

The maximum contribution towards total genetic divergence was from average fruit length. All the 31 brinjal genotypes were grouped into six clusters using Ward’s method and cluster IV and VI accounted for 7 genotypes followed by cluster II (6), I and III (4) and V (3).

Intra cluster distance was minimum in cluster IV while maximum in cluster I. The inter cluster distance was minimum between III and V and the genotypes of these clusters could be used in hybridization programme to develop heterotic hybrids.

The elite genotypes form different clusters may be chosen for further breeding programme in addition for further genetic studies either by way of Line X Tester or diallel analysis.


ABSTRACT

The present experiment entitled “Studies on the effect of plant growth regulators and zinc on vegetative growth, flowering corm and cormel production in gladiolus (Gladiolus grandiflorus L.) Cv. White Prosperity.” were carried out during 2010-2011 at College of Horticulture, Andhra Pradesh Horticulture University, Venkataramannagudem, West Godavari district.

The present studies were conducted under two experiments, the first experiment was on the effect of plant growth regulators on vegetative growth, flowering, corm and cormel production with 9 treatments in 3 replications in a Randomized block design. The second experiment was on the effect of zinc on vegetative growth, flowering, corm and cormel production with 9 treatments and 3 replications in a Factorial Randomized block design.

Among the vegetative parameters, the treatment GA\textsubscript{3} at 100 ppm recorded maximum values for plant height and leaf length over other treatments. NAA at 250 ppm recorded the maximum number of leaves, leaf width and leaf area over other treatments. TIBA at 150 ppm recorded minimum plant height, number of leaves and leaf area.

Among the floral parameters, TIBA at 150 ppm recorded minimum number of days to first floret appearance (82.56), and 50 percent flowering (90.93). Similarly BA at 100 ppm recorded maximum number of spikes per corm (1.40). However higher mean spike length (137.98 cm) and number of florets per spike (14.06) were recorded with GA\textsubscript{3} at 100 ppm. The minimum spike length and number of florets were observed with TIBA at 150 ppm.

In case of corm and cormel parameters GA\textsubscript{3} at 100 ppm recorded maximum corm size and weight while BA at 100 ppm recorded maximum number of cormels produced per corm (29.75) cormel weight per corm (14.00 g) and highest propagation coefficient (194.20).
In the second experiment, the treatment 2% zinc has significantly increased plant height, number of leaves, leaf length, leaf width and leaf area at 40, 60 and 80 DAP, with highest values when sprayed at 6 weeks after planting compared to 4 and 8 after planting, minimum values were observed with control.

Among the floral parameters, the treatment 2% zinc recorded more number of days (97.63) to first floret appearance and 50% flowering (103.32) over other treatments. Whereas, control recorded minimum number of days to first floret appearance and 50% flowering. Similarly, the treatment 2% zinc recorded more number of spikes (1.33), spike length (112.19 cm), number of florets per spike and highest spike growth rate (0.68 cm/day). While the interaction of 2% zinc and 6 weeks after planting recorded maximum spike length (118.36 cm) and number of florets (13.40).

The treatment 2% zinc recorded maximum values for corm size (4.47 cm), corm weight (37.97 g) number of cormels (32.90) and cormel weight per corm (10.72 g). In case of time of spraying, spraying at 6 weeks after planting recorded maximum values for corm size, corm weight, number of cormels and cormel weight while minimum values were observed in control. The maximum propagation coefficient was observed with 2% zinc (168.09) followed by 1.5% zinc (154.24) compared to 4 and 8 weeks after planting, while lowest propagation coefficient was recorded with control (127.81).

65) “Genetic divergence studies in amaranthus (Amaranthus tricolor L.)” - V.Sravanthi

ABSTRACT

In the present investigation, a set of 43 genotypes comprising of 40 germplasm lines and three checks of amaranthus (Amaranthus spp.) were evaluated in a randomized block design with three replications at NBPGR Regional Station, Rajendranagar, Hyderabad during kharif 2010 for nineteen seed yield attributes and seven foliage yield attributes so as to identify the horticulturally superior genotypes for seed and leaf production, respectively.

The analysis of variance revealed significant difference for all the nineteen seed yield attributes and seven foliage yield attributes among the genotypes. From the results of the mean performance it is evident that the genotypes SNTV-32, IC-313546 and IC-526834 were found to be horticulturally superior for majority of the seed yield attributes while, the genotypes IC-313546, IC-426559 and SNTV-56 were found to be horticulturally superior for majority of the foliage yield attributes in amaranthus.

Multivariate analysis following Mahalanobis $D^2$ statistics revealed distinct clustering pattern and considerable genetic diversity within and between clusters and were grouped into eight clusters. The selection and involvement of the horticulturally superior and divergent parents from the divergent clusters for seed yield (cluster VII and VIII) and for foliage yield (cluster VI and VII) is expected to give high heterosis and throw more useful segregants. The characters stem weight, leaf area, dry matter content, protein content, days to 80 percent maturity of seed for seed purpose and the characters leaf area, foliage yield per plant per cutting and leaf length were found to be the potent factors in differentiating the genotypes under study.

From the coefficient of variation it is evident that the estimates of PCV were higher than the corresponding GCV for all the nineteen growth, earliness and seed yield attributes and seven growth and foliage yield attributes indicating the greater influence of environment on the expression of these characters. The estimates of genotypic and phenotypic coefficient of
variation for almost all the growth, earliness and seed yield attributes except protein content and majority of the growth and foliage yield attributes except plant height at first cutting and foliage yield per plant per cutting indicating that the variability observed in 43 genotypes of amaranthus is high (>20%) offering ample scope for selection.

All the nineteen growth, earliness and seed yield attributes for seed production and all the seven growth and foliage yield attributes for leaf production had high heritability (>60%) accompanied with high genetic advance over percent of mean (>20%) indicating that most likely the heritability is due to additive gene action and the chances of fixing by selection is easy to improve these traits.

From the correlation coefficient analysis it is evident that, the characters plant height, stem girth, stem weight, leaf area, leaf length, leaf width, petiole length, total leaf weight per plant, days to 50 percent flowering, inflorescence length, lateral spikelet length, days to 80 percent maturity of seed, leaf/stem ratio and dry matter content had positively significant association, while protein content and 1000 seed weight had negatively significant association with seed yield. All of the seven growth and foliage yield characters viz., height at first cutting, leaf length, leaf width, leaf area, number of cuttings per plant, foliage yield per plant per cutting had positively significant association with foliage yield suggesting that selection based on these characters will be useful in increasing yield per plant in amaranthus.

From the path coefficient analysis, it is evident that the characters leaf length, stem weight and inflorescence length had high positive direct effect and the characters plant height, stem girth, leaf area had high negative direct effect on seed yield. Leaf length had high positive direct effect and leaf area had high negative direct effect on total foliage yield per plant indicating that these traits are more reliable for selection for genetic improvement of seed yield and foliage yield respectively. The residual effect of 0.6828 (P) and 0.6081 (P) is high indicating that some other characters which have not been studied here need to be included in this analysis to account fully for the variation in seed yield and foliage yield, respectively.

In conclusion, the characters plant height, stem girth, leaf area, leaf length, stem weight and inflorescence length having higher estimates of heritability, genetic advance over percent of mean, significant correlation and high direct effect were found to be the yield components for seed production, while the characters leaf length and leaf area were found to be the yield components for leaf production. Therefore, selection based on these yield components the horticulturally superior and genetically divergent genotypes for seed yield and foliage yield following any one of the pure line selection or mass selection, progeny selection, hybridization and selection with pedigree breeding is expected to result in genetic improvement of seed or foliage yield in amaranthus.

**66) “Effect of sowing dates on growth, yield and quality of certain carrot (Daucus carota Linn.) cultivars” - Madhavi Latha Polaki**

**ABSTRACT**

The present investigation entitled “Effect of sowing dates on growth, yield and quality of certain carrot (Daucus carota Linn.) cultivars” was carried out during *rabi* of 2010-2011 at College of Horticulture, Venkataramannagudem, West Godavari District of Andhra Pradesh. The study was carried out with four different sowing dates viz., November 10th, November 25th, December 10th and December 25th and three cultivars namely Pusa Kesar, Pusa Rudhira and Kuroda Improved. The experiment was laid out in a split plot design with three replications and
the data on effect of different dates of sowing and different varieties on growth, yield, yield attributes and quality attributes were recorded and statistically analyzed.

Sowing time has shown significant effect on the growth parameters like plant height, number of primary and secondary branches. Highest plant height and maximum number of primary branches and secondary branches were produced by plants which were sown early i.e., on November 10th. Similarly, various yield attributes viz. fresh weight of the plant, fresh and dry weight of the root, root length, root diameter, root shoot ratio and core thickness; yield per plot and yield per hectare were highest from November 10th sowing. In the experiment, November 10th sowing gave the highest yields of 172.82 q ha⁻¹ compared to the lowest yield of 67.98 q ha⁻¹ by December 25th sowing. Moisture percentage, TSS, reducing and total sugars were also significantly affected by sowing dates. Sowing carrot at 10th November recorded the highest values of each of the above mention parameters. All the parameters viz., growth, yield, yield attributes and quality showed decreasing trend as sowing date was delayed.

Results also revealed that all the growth parameters, yield and yield attributes and quality parameters also significantly affected by different varieties. Growth parameters such as plant height, number of primary and secondary branches were maximum with Kuroda Improved variety irrespective of dates of sowing. Similarly, the root yield and yield contributing characters were also found to be maximum with Kuroda Improved variety. Highest yield (149.16 q ha⁻¹) was obtained with the Kuroda Improved variety, followed by Pusa Rudhira (121.39 q ha⁻¹), and the lowest (111.49 q ha⁻¹) was with Pusa Kesar. Whereas Pusa Rudhira was found to be the best in respect of quality judged.

In the same concern, the interaction between sowing dates and varieties also showed significant effect in case of plant height, yield attributes, yield and TSS. Combined effect of sowing dates and varieties showed that early sowing on November 10th, all cultivars performed well with respect to yield and yield components. However, among all the treatmental combinations Kuroda Improved variety sown on 10th November recorded the best in respect of yield and yield components, whereas Pusa Rudhira was found to be the best with respect to quality judged which was sown on the same date i.e., 10th November.

Interaction between the two factors under investigation did not show any effect on the growth parameters like germination percentage, number of primary and secondary branches and quality attributes viz., moisture percentage, total sugars and reducing sugars.

67) “Effect of different levels of Nitrogen and Phosphorus on growth and seed yield of Coriander (Coriandrum sativum L.) cv. Sudha”- Sridevi Chodapuneedi.

ABSTRACT

The present investigation entitled “Effect of different levels of Nitrogen and Phosphorus on growth and seed yield of Coriander (Coriandrum sativum L.) cv. Sudha” was carried out during rabi 2010-2011 at College of Horticulture, Venkataramannagudem, W.G Dist. The study was carried out with four different levels of nitrogen (20, 40, 60 and 80 kg N/ha) and four different levels of phosphorus (20, 30, 40 and 50 kg P₂O₅/ha). The experiment was laid out in a factorial randomized block design with three replications and the data on the effect of different levels of nitrogen and phosphorus on vegetative growth parameters, yield and yield attributes, nutrient uptake and economics in coriander cv. ‘Sudha’ was recorded and statistically analyzed.

Increased levels of nitrogen showed significantly increased influence on growth parameters. Plant height, number of branches per plant, days to 50% flowering, days to maturity and biomass production per plant (g) were highest with the treatments receiving higher levels of nitrogen (80 kg N ha⁻¹). However nitrogen at 20 kg ha⁻¹ took less number of
days to maturity. Similarly various yield attributes viz. number of umbels per plant, number of umbellets per plant, number of seeds per plant, weight of 1000 seeds and seed yield per hectare were highest with 80 kg N ha⁻¹. Highest seed yield of 1165.4 kg/ha recorded with 80 kg N ha⁻¹ compared to the lowest yield of 841.1 kg/ha by 20 kg N ha⁻¹.

It is also revealed from the results that all the growth parameters, yield and yield attributes were significantly influenced by different levels of phosphorus. Growth parameters like plant height, number of branches per plant and biomass production per plant (g) were maximum with the application of 40 kg P₂O₅ ha⁻¹. Similarly yield and yield contributing characters were significantly increased with increased levels of phosphorus upto 50 kg P₂O₅ ha⁻¹. The highest yield (1033.1 Kg/ha) was obtained with phosphorus at 50 kg ha⁻¹ followed by phosphorus at 40 kg ha⁻¹ (1013.9 Kg/ha) and the lowest (960.8 Kg/ha) was with 20 kg P₂O₅ ha⁻¹.

In the same concern, the interaction between different levels of nitrogen and phosphorus also showed highly significant effects on growth parameters and yield attributes. The treatmental combination of 80 kg N ha⁻¹ and 40 kg P₂O₅ ha⁻¹ recorded the best in respect of growth parameters and yield components.

Nutrient uptake and economics were also significantly influenced by different levels of nitrogen. Maximum uptake of nitrogen was observed with the 80 kg N ha⁻¹. Phosphorus also significantly influences the uptake of nitrogen and phosphorus. The treatmental combination of 80 kg N ha⁻¹ and 50 kg P₂O₅ ha⁻¹ recorded the maximum uptake of nitrogen and phosphorus. However, highest net returns (Rs.83, 245) and benefit cost ratio (7.03) was recorded with 80 kg N ha⁻¹ and 40 kg P₂O₅ ha⁻¹.

68) “Studies on flowering and fruiting behaviour of Sapota (Manilkara achras (Mill.) Fosberg) cultivars in coastal regions of A.P.” - Bommina Narendra Kumar.

ABSTRACT

An investigation was carried out during 2010-2011 at Horticultural Research Station, Venkataramannagudem, West Godavari District, Andhra Pradesh with the objective of understanding branching pattern and its relation to flowering, fruiting behaviour and pattern of fruit development in different cultivars of sapota.

The experiment was carried out with 11 varieties viz. Cricket Ball, Pala, Kalipatti, Singapore, DHS-1, DHS-2, PKM-1, PKM-2, PKM-3, CO-1, CO-2 in a Randomized Block Design (RBD) with three replications. The canopy of the tree was divided into three strata viz. lower strata (up to 1/3rd height of the canopy from ground level), middle strata (1/3rd to 2/3rd height) and upper strata (top 1/3rd height of the canopy) and data were recorded on randomly selected branches of all the strata. The terminal portion of branch was designated as N order and the subtending orders as N-1, N-2 and so on and observations were recorded from tip downwards of a branch.

Irrespective of the strata and variety, the mean number of branches produced at different orders decreased gradually from tip downwards with maximum values recorded at N order i.e., the tip. The number of branches ranged from 2.890 (N order) to 0.906 (N-7) in the lower strata, from 2.760 (N) to 0.681 (N-6) in the middle strata and from 2.555 (N) to 0.879 (N-5) in the upper strata. Relatively higher number of branches was produced in lower strata compared to the middle and upper strata. Among the cultivars maximum number of branches were recorded in lower strata (2.181), and middle strata (2.184) by cv.DHS-2 whereas in the upper strata by cv. Pala (2.079).

The number of flowers and flower bearing units (branches) decreased from tip downwards irrespective of the strata and variety. The number of flowers ranged from 1.160 (N-
7) to 5.247 (N-2) in the lower strata, from 1.353 (N-6) to 4.550 (N-2) and from 1.803 (N-5) to 4.264 (N-3) in the middle and upper strata respectively. Flowering was intense at N-2 to N-4 orders. Among the varieties, highest number of flowers was recorded in lower strata of cv. PKM-1 (5.073), in middle strata of cv. Kalipatti (5.693) and in upper strata of cv. PKM-2 (5.392).

The fruit set at different branch orders decreased gradually from tip downwards. The number of fruits produced ranged from 0.315 (N-7) to 1.480 (N-2) in the lower strata, from 0.572 (N-6) to 1.321 (N-3) in the middle strata and from 0.482 (N-5) to 1.534 (N-3) in the upper strata. The per cent set also followed trends similar to that of number of fruits produced. Among the different varieties, cv. PKM-1, Kalipatti and Pala produced higher number of fruits over other varieties in all the strata. Relatively higher number of fruits were produced on the branches of lower strata as compared to those on middle and upper strata. Thus, fruiting was mainly concentrated on the lower strata and on laterals produced at orders N-2, N-3 and N-4.

The number of days required from fruit set to harvest differed significantly with the varieties. The cv. DHS-2 recorded the highest number of days (263.46) to attain harvestable maturity followed by cv. DHS-1 (258.00) and Cricket Ball (257.93) while the lowest was observed in cv. PKM-1 (189.33). The weight was maximum in cv. Cricket Ball (123.20 g) followed by cv. DHS-1 (122.40 g) while it was minimum in cv. Pala (32.09 g) and PKM-1 (46.18 g). The pattern of fruit development in terms of fresh weight of the fruit followed double sigmoid growth curve and maximum increase in fruit weight was observed between 150-210 days after set.

The number of flowers and fruits produced were positively correlated with the total number of lateral branches produced at different orders. Further research on canopy management by way pruning and its impact on fruiting of sapota has been suggested.

69) Studies on sex and sex modification with silver nitrate in Kakrol (Mamordica dioica Roxb) - Gali Parimala

ABSTRACT

The present investigation entitled “Studies on sex and sex modification with silver nitrate in kakrol (Mamordica dioica Roxb)” was carried out during kharif season of 2010-2011 at College of Horticulture, Venkataramannagudem, W.G Dist. The first experiment was carried out with 7 treatments i.e 100 ppm AgNO₃, 200 ppm AgNO₃, 300 ppm AgNO₃, 400 ppm AgNO₃, 500 ppm AgNO₃, 600 ppm AgNO₃ and control. Experiment was laid out in a randomized block design with three replications and the data on effect of different concentrations of silver nitrate on sex modification, growth characters, yield contributing characters and yield were recorded and statistically analyzed.

Another experiment was carried out to identify the morphological marker characters between male and female sex forms in kakrol. The male and female plants each of 10 were taken, observed morphological characters and evaluated the differences between male female sex forms and the results were analyzed through the two sample t-test.

Silver nitrate was sprayed in different concentrations on female plants at pre floral stage. As a result development of hermaphrodite was observed at 20 to 25 days after spraying. Spraying of silver nitrate at the rate of 600 ppm significantly affected the stamen length at 8th, 10th, and 12th day (7.80 mm, 8.60 mm, 8.66 mm) respectively and stigma length at 8th, 10th, and 12th day (8.06 mm, 9.73 mm, 10.0 mm) respectively over the other treatments. The lowest stamen length and stigma length were recorded with 100 ppm silver nitrate. The growth characters like calyx length at 8th, 10th and 12th day after spraying were (1.46 cm, 1.27 cm and 0.93 cm) respectively. Leaf area also recorded highest at 500 ppm AgNO₃ i.e (2583.33) cm².

The yield characters like fruit diameter, fruit stalk length, individual fruit weight; number of
seeds per fruit and fruit yield were found to be significant at 500 ppm silver nitrate application. The plants sprayed with 600 ppm silver nitrate were affected by toxicity symptoms *i.e.* wilting of vines and scorching.

The second experiment results revealed that the plant height, internodal length, leaf margins, number of lobes, leaf shapes and days to appearance of first male and female flowers were found to be significant. By observing these characters we can differentiate between male and female plants. The plant height, internodal lengths were more in male plants than on female plants. The number of lobes in leaf was more in female plants. Male flower appear earlier than female flowers. The leaf shape of female plant was mostly mapple like where that of male plant was cordate and mapple.

The characters like leaf length, leaf width, petiole length, tendril length, leaf area were found to be non significant. Primary leaf shape, leaf colour were not differing in male and female sex forms. The morphological marker characters help in differentiating male and female sex forms of kakrol were plant height, internodal length, leaf margins, number of lobes, leaf shapes and days to appearance of first male and female flowers.

70) “*Effect of harvesting at different levels and growth regulators on growth and flower yield of carnation (Dianthus caryophyllus L.)*” – Ashwini Kasturi.

**ABSTRACT**

The present investigation on “Effect of harvesting at different levels and growth regulators on growth and flower yield of carnation (*Dianthus caryophyllus* L.) in second season crop.” was undertaken at Commercial Floriculture Farm at Mudimyal, Ranga Reddy district, A.P during July 2010 to February 2011. The three experiments were laid out in randomized block design with factorial concept.

Exp 1: “Studies on the effect of harvesting at different heights on growth and cutflower yield of carnation in second season crop”

Exp 2: “Studies on the effect of harvesting at different nodes on growth and cutflower yield of carnation in second season crop”


In the present study, harvesting of carnation flower stalks at 10 cm height proved to be superior with regard to all the growth and flowering characters studied during the experiment period. Between the cultivars, cv. Domingo has performed superior over other two Cvs. Dover and Kiero. Between these two cultivars cv. Dover performed better than cv. Kiero Number of buds per node, length of lateral, flower stalk length, diameter of flower stalk, flower length, flower diameter, length of neck, number of flower ligules, fresh flower weight and vase life of cut flower were maximum and number of days to bud sprout was minimum in cv. Domingo with harvesting at 10 cm height from the ground level than other harvesting heights studied *i.e.* 5, 15, 20 cm height from the ground level. Harvesting at 20 cm height recorded maximum number of buds per harvested stalk and also maximum flower stalks per plant but the flowers were not of acceptable quality as cut flower as they have poor flower quality.
Flowering characters like number of days for first flower bud appearance, 50 per cent flower bud appearance, for colour break stage and harvesting of flower stalks was minimum with harvesting at 10 cm height from the ground level. Number of buds per node, length of lateral, flower stalk length, diameter of flower stalk, flower length, flower diameter, length of neck, number of flower ligules, fresh flower weight and vase life of cut flower were maximum and number of days to bud sprout was minimum in cv. Domingo with harvesting at 3rd node from the ground level than other harvesting nodes studied i.e. 2nd, 4th, 5th nodes from the ground level.

Flowering characters like number of days for first flower bud appearance, 50 per cent flower bud appearance, for colour break stage and harvesting of flower stalks was minimum with harvesting at 3rd node. Among the growth regulators studied GA₃ recorded minimum number of days to bud sprout by increasing the concentrations from 150 to 250 ppm and BA also recorded minimum number of days to bud sprout by increasing the concentrations from 250 to 350 ppm whereas NAA recorded maximum number of days to bud sprout by increasing the concentrations from 250 to 350 ppm.

GA₃ promoted early flowering and reduced the number of days to 50% flowering, colour break stage and harvest of flower stalks with higher concentrations. Floral characters such as flower stalk length, flower length, flower diameter, flower neck length, number of flower ligules per flower and fresh weight of flower were maximum with increasing concentration of GA₃ from 150 to 250 ppm. BA recorded maximum number of buds sprouted per node and per harvested stalk. BA significantly increased the number of flower stalks harvested per plant with higher concentrations and vase life of cut flower also increased.

NAA delayed the first flower bud appearance and significantly increased the number of days to 50% flowering, days to colour break stage, days to harvest of flower stalks by increasing the concentrations of NAA from 250 to 350 ppm. All the parameters studied recorded the best results with spray of growth regulators immediately after harvest of flower stalk than 15 and 30 days after harvest.

71) “Effect of pre-sowing treatments on growth, vigour and graft success in mango (Mangifera indica Linn.)” - Hima Bindu Aatla.

**ABSTRACT**

The present investigation on “Effect of pre-sowing treatments on growth, vigour and graft success in mango (Mangifera indica Linn.)” was conducted at Experimental Learning - Hands on Training Nurseries, College of Horticulture, Rajendranagar, during July 2010 to January 2011. The two experiments were laid out in randomized block design with factorial concept and the third experiment was laid out in randomized block design.

Exp 1: “Effect of pre- sowing treatments on germination, growth and vigour of mango cv. Totapuri.”
Exp 2: “Effect of pre-sowing treatments on germination, growth and vigour of mango cv. Alphonso.”

Exp 3: “Effect of two best performed pretreatments in each of Totapuri and Alphonso rootstocks on performance of graft-take.”

In the present study, pre-sowing treatment of mango stones with KNO₃ at 0.5 % proved to be superior with regard to all the germination, growth and vigour characters studied during the experiment period.

Among the seed materials, extracted kernel has performed superior over whole nut with regard to all the germination, growth and vigour characters.

In mango cv. Totapuri, minimum number of days taken for initiation of germination and 50 per cent of germination and maximum rate of germination and germination percentage were observed with extracted kernel pre-treated with KNO₃ at 0.5 % over other pre-sowing treatments i.e. KNO₃ at 1.0 %, GA₃ at 250 ppm, GA₃ at 500 ppm, Water soaking and Control.

Growth characters like number of leaves, leaf length and width, root length and spread and root to shoot ratio were maximum with extracted kernel pre-treated with KNO₃ at 0.5 %. In cv. Totapuri, GA₃ at 500 ppm recorded maximum seedling height and internodal length but the seedling diameter is not suitable for grafting as they are very thin.

Vigour characters like vigour of seedling and vigour index were maximum with extracted kernel pre-treated with KNO₃ at 0.5 % in cv. Totapuri.

Similarly in mango cv. Alphonso, extracted kernel pretreated with KNO₃ at 0.5 % proved to be superior with regard to all the germination, growth and vigour characters.

Among the pre-sowing treatments studied KNO₃ at 0.5 % recorded early sprouting of buds on scion, early emergence of 1st and 2nd flush of leaves.

Graft-take, internodal length, number of leaves, root to shoot ratio, graft diameter and graft height were maximum with extracted kernel pre-treated with KNO₃ at 0.5 % in mango cv. Totapuri.

All the parameters studied recorded the best results with extracted kernel pre-treated with KNO₃ at 0.5 % in mango cv. Totapuri.

72) “Effect of organic manures, biofertilizers and inorganic fertilizers on growth and yield of senna (Cassia angustifolia Vahl.)” – Aruw Kayina.

ABSTRACT

A field experiment was conducted during Rabi, January to June 2011 to study the “Effect of organic manures, biofertilizers and inorganic fertilizers on growth and yield of senna (Cassia angustifolia Vahl.)” grown on red sandy loam soil at Herbal Garden, Andhra Pradesh Horticultural University, Rajendranagar, Hyderabad. The experiment was laid out in randomized block design with twelve treatments replicated thrice.

The treatments consisted of 100 % RDF (150:50:50 kg ha⁻¹), 100% RDF +Azospirillum at 200g kg⁻¹ seed, 75% RDF (113:38:38 kg ha⁻¹)+Azospirillum at 200g kg⁻¹ seed, 50% RDF (75:25:25 kg ha⁻¹)+Azospirillum at 200g kg⁻¹ seed, Vermicompost 10 t ha⁻¹, Vermicompost 7.50 t ha⁻¹+Azospirillum at 200g kg⁻¹ seed, Vermicompost 3.75
t ha\(^{-1}\)+Azospirillum at 200g kg\(^{-1}\) seed, Vermicompost 1.80 t ha\(^{-1}\)+ Azospirillum at 200g kg\(^{-1}\) seed, Neem Cake 3 t ha\(^{-1}\), Neem Cake 2.2 t ha\(^{-1}\)+ Azospirillum at 200g kg\(^{-1}\) seed, Neem Cake 1.5 t ha\(^{-1}\)+Azospirillum at 200g kg\(^{-1}\) seed and Neem Cake 0.75 t ha\(^{-1}\)+Azospirillum at 200g kg\(^{-1}\) seed.

The results of the present investigation revealed that among the different traits, the highest plant height (78.10 cm) was recorded with the application of 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed which was at par with Vermicompost 10 t ha\(^{-1}\) (75.29 cm). The leaf dry weight plant\(^{-1}\) (13.91 g) at final harvest was highest with the application of 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed which was on a par with Vermicompost 10 t ha\(^{-1}\) (12.92 g). While the highest shoot dry weight per plant (16.81 g) was recorded with 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed which was followed by Neem Cake 2.2 t ha\(^{-1}\)+ Azospirillum at 200g kg\(^{-1}\) seed (14.38 g). But the parameters like leaf area (136.37 cm\(^{2}\)) and dry matter production (17.51 q ha\(^{-1}\)) were highest with 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed and was on a par with Vermicompost 10 t ha\(^{-1}\) (135.39 cm\(^{2}\), 16.77 q ha\(^{-1}\)).

The yield parameters like number of pods plant\(^{-1}\) (58.98), pod length (5.88 cm), fresh and dry weight of pods plant\(^{-1}\) (35.37g and 12.29 g respectively), dry leaf and pod yield (6.78 q ha\(^{-1}\) and 4.32 q ha\(^{-1}\) respectively) were highest with 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed and was on a par with Vermicompost 10 t ha\(^{-1}\). (87.70, 60.69 and 114.71 kg ha\(^{-1}\) respectively).

Economic analysis revealed that the highest net returns were recorded with 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed (Rs 52,957 ha\(^{-1}\)) followed by Vermicompost 10 t ha\(^{-1}\) (Rs 45,822 ha\(^{-1}\)). Also the highest benefit cost ratio was recorded with 75% RDF (113:38:38 kg ha\(^{-1}\)) + Azospirillum at 200g kg\(^{-1}\) seed (2.91) followed by 100 % RDF (150:50:50 kg ha\(^{-1}\)) (2.32).

**ABSTRACT**

The present investigation entitled “STUDIES ON POST-HARVEST BEHAVIOR OF ORGANICALLY GROWN BANANA (Cv. GRANDNAINE) *vis-a-vis* conventionally grown banana” was carried out during 2010-2011 at the Horticultural Research Station, Kovvur, West Godavari district of Andhra Pradesh. Experiment was carried out to know the effect of organic manures (FYM, poultry manure (PM), vermicompost (VC)) along with biofertilizers [Azospirillum, Arbuscular mycorrhizal fungi (AMF) and phosphate solubilizing bacteria (PSB)] on physico-chemical
parameters and shelf life of banana fruits, observed at ambient and refrigerated (14±1°C) storage conditions.

A set of two experiments were conducted in CRBD with factorial concept and the treatments were replicated three times. Physico-chemical characters were recorded at 2 days interval at ambient condition and 4 days interval at low temperature storage.

It was observed that the physiological loss in weight, colour index, spoilage per cent, pulp to peel ratio increased while the fruit firmness, peel thickness decreased irrespective of the treatments and storage with the advancement of storage period. While, the total soluble solids, reducing, non-reducing and total sugars, acidity, organoleptic scores increased initially and then decreased towards the end of the shelf life, the ascorbic acid decreased towards the end of the storage period.

In the first experiment, poultry manure + *Azospirillum* + AMF recorded lower physiological loss in weight (10.00), colour development (3.23), spoilage (8.51), pulp to peel ratio (1.78), acidity (0.22) and higher firmness (3.76), total soluble solids (18.09), reducing sugars (7.30), non-reducing sugars (8.19), total sugars (15.49), ascorbic acid (10.88) and thereby recorded more shelf life (16 days) than rest of the treatments. However, organoleptic evaluation for appearance, flavour and over all acceptability was higher for vermicompost + *Azospirillum* + AMF which was on par with, poultry manure + *Azospirillum* + AMF.

At refrigerated storage less physiological loss in weight (8.05), colour development (3.27), spoilage (7.61), pulp to peel ratio (1.71), acidity (0.23) and higher firmness (4.37), Total Soluble Solids (16.10), reducing sugars (7.25), non-reducing sugars (8.10), total sugars (15.32), ascorbic acid (11.11) and organoleptic score was observed with poultry manure + *Azospirillum* + AMF and thereby registering increased shelf life of 20 days over 100% RDF treatment.


**ABSTRACT**

The present experiment entitled “Studies on the effect of plant growth regulators on growth, flower yield and vase life of China aster (*Callistephus chinensis* (L.) Ness) cv. Kamini in coastal districts of Andhra Pradesh” was carried out during 2010-2011 at College of Horticulture, Andhra Pradesh Horticulture University, Venkataramannagudem, West Godavri district.

The present experiment is designed to study the effect of plant growth regulators namely GA₃ at 100 ppm, 200 ppm, 300 ppm, NAA at 100 ppm, 200 ppm, 300 ppm, MH at 500 ppm, 750 ppm, 1000 ppm and CCC at 1500 ppm, 2000 ppm and 2500 ppm on vegetative growth, flowering, and vase life of china aster with 13 treatments in three replications in a randomized block design.
Among the vegetative parameters, the treatment GA$_3$ at 200 ppm recorded maximum values for plant height, number of branches, internodal length, number of leaves and leaf area over other treatments. NAA at 300 ppm application resulted in minimum number of branches per plant over other treatments. MH at 1000 ppm application resulted in minimum plant height, internodal length, number of leaves per plant and leaf area.

Among the treatments, CCC at 1500 ppm recorded minimum number of days to first floret appearance (51.68), and 50 percent flowering (60.25). GA$_3$ at 200 ppm application enhanced the duration of flowering (90.33), number of flowers per plant (68.54), diameter (4.86 cm), flower weight (3.26 g), flower yield per plant (111.2 g), per plot (14.91 kg), per hectare (30.87 Q) and vase life (22.88 days).

Flower diameter was minimum with NAA 100 ppm (3.14 cm) and flower weight was minimum with NAA 300 ppm (1.42 g), whereas maximum number of days to first floret appearance (63.80), and 50 percent flowering (73.22 days) was with control. Control recorded minimum duration of flowering (63.24 days), number of flowers per plant (29.49), flower yield per plant (52.39 g), per plot (9 kg), per hectare (18.63 Q) and vase life (16 days) also.

It was found that GA$_3$ at 200 ppm was best in improving the yield and vase life of China aster cv Kamini.


**ABSTRACT**

The present investigation entitled *Studies on effect of Modified atmosphere packing on shelf life of guava (Psidium guajava) cv. Allahabad Safeda* was conducted at FRS Sangareddy, College of Horticulture, Rajendranagar, Hyderabad during the year 2010-2011. Studies on effect of Modified atmosphere packing on shelf life of guava was observed at ambient and low temperature(10±1°C).

Two experiments were divided into four experiments and were conducted in CRBD with factorial concept and the treatments were replicated three times. The first two experiments were conducted to study the response of guava fruits to the modified atmosphere packing and other two experiments were to study the ripening behaviour after removal from modified atmosphere packing to ambient condition. The fruits were treated with 2.5% O$_2$ and 2.5% CO$_2$, 2.5% O$_2$ and 5% CO$_2$, 5% O$_2$ and 5% CO$_2$, 5% O$_2$ and 2.5% CO$_2$, packing without gases and control. Physico-chemical characters were recorded at 4 days interval at ambient condition and 10 days interval at low temperatures.

It was observed that the Modified Atmosphere Packages(MAP) delayed and suppressed respiratory and ethylene peaks during ripening. It was effective in reducing weight loss and maintaining firmness of fruit. The changes in total soluble solids,
acidity, ascorbic acid, and sugars were retarded by Modified Atmosphere Packing (MAP), the extent of which was dependent upon cultivar, storage temperature and atmosphere composition. Chilling injury and decay incidence were reduced during ripening of fruit stored in optimal atmospheres compared to air-stored fruit.

A greater suppression of respiration and ethylene production was observed in fruit stored in 5% O₂ and 5% CO₂ compared to the other MA treatments. In brief, MAP as a storage technique at a level of 5% O₂ and 5% CO₂ and stored at ambient and low temperature( 10±1°C) was the best treatments with Guava cv. Allahabad safeda to inhibit the ripening process and maintain the postharvest quality for 12 days at ambient condition and up to 30 days at low temperature( 10±1°C).

76) “Influence of different herbicides on weed control, growth, flowering and yield of gladiolus (Gladiolus grandiflorus) cv. White Prosperity” – Swathi Desai.

ABSTRACT

A field experiment on “Influence of different herbicides on weed control, growth, flowering and yield of gladiolus (Gladiolus grandiflorus) cv. White Prosperity” was conducted at All India Coordinated Research Project on Floriculture, Horticultural Research Institute, College of Horticulture, Andhra Pradesh Horticultural University, Rajendranagar, Hyderabad during the year 2010-11. The experiment was laid out in Randomized Block Design with twelve treatments and replicated thrice.

The results of the experiment indicated considerable difference among the treatments with respect to vegetative, floral and corm characteristics.

Maximum growth attributes viz., plant height, leaf length, leaf area were recorded in T₁₂ while the maximum number of leaves per plant was obtained in T₇ & T₁ and maximum leaf width was recorded in pendimethalin T₈ at higher concentration. Non significant result was recorded with respect to leaf width at initial stages with the different treatment combinations.

Further, it was observed that the different floral attributes viz., minimum days taken to 50% flowering observed in paddy straw mulch which was on par with T₇, minimum days taken to spike initiation, maximum number of spikes per plant, maximum spike length , rachis length, minimum days taken for basal flower to open, maximum fresh weight of spike, floret length, floret diameter were observed in T₁₂ where as maximum number of florets per spike and maximum number of spikes per plot was obtained in pendimethalin T₇.
Among yield and corm attributes, maximum number of corms per plant were recorded in T_7, maximum diameter of corm and fresh weight of corm was observed in paddy straw mulch T_12, maximum number of cormels per plant, maximum diameter of cormels and fresh weight of cormels per plant was obtained in post emergence herbicide quizalofop ethyle T_9.

Among all treatments lowest weed count, dry weight, weed index and highest weed control efficiency was recorded in treatment pendimethalin at lower concentration with one hand weeding T_7.

The highest nutrient content in plants such as nitrogen, phosphorus and potassium were recorded in treatment T_1, T_4 and T_3 & T_12 respectively.

The results from the present study clearly showed that the application of pendimethalin at lower concentration 0.75 kg a.i. ha^{-1} followed by one hand weeding and paddy straw mulch resulted in the maximum net returns (Rs. 7,96,180 & Rs. 7,43,538) respectively with a benefit cost ratio of (1.21:1).


ABSTRACT

A laboratory experiment entitled “Effect of post harvest treatments with Growth regulators and chemicals on shelf life of Sweet orange("citrus sinensis" L.Osbeck) Cv. Sathgudi” was conducted at Post Harvest Technology Laboratory, College of Horticulture, Rajendranagar, Hyderabad during 2008-2009.

The first set of experiments consists of growth regulators namely GA_3 (100 and 200 ppm), BA (100 and 200 ppm), SA (100 and 200 ppm) and control. All the treatments replicated thrice with CRD factorial concept. The fruits were analyzed for physiochemical properties at an interval of 5 days.

Another set of experiment consist of chemicals viz., namely Ca(NO_3)_2 (0.5% and 1%), NaCl (0.5% and 1%), CaCl_2 (0.5% and 1%) and control. The treatments were replicated thrice with design of CRD with factorial concept. The fruits were analyzed at an interval of 5 days for physico-chemical properties.

The fruits treated with GA_3 200ppm recorded a shelf life of 30.09 days as against 8.89 days in control. The fruits had lesser colour change, lower rotting percent, higher juice percent and higher peel thickness.

There was an increase in TSS content of fruit juice with increase in storage period, GA_3 200 ppm treated fruits recorded lower TSS content and more shelf life recorded. The fruits had higher titrable acidity, lesser reducing sugars and TSS/Acid ratio.

Among the chemicals Ca(NO_3)_2-1% resulted in increasing the shelf life of fruits to 27.09 days as against 8.89 days in control.
The treatment resulted in bringing of slow change of colour lesser rotting percent and peel thickness. TSS content in fruits was registered lowest coupled with higher titable acidity resulted in lower TSS/Acid ratio.

78) “Genetic Diversity Studies In Paprika Germplasm (Capsicum annuum L.)”- S.V. Vishnu VArdhann.

ABSTRACT

A field experiment was conducted to estimate the genetic variability and genetic divergence in paprika and to carry out yield component analysis through correlation and path analysis. Fifty five exotic and indigenous genotypes along with three checks were sown in a randomized block design with three replications, during rabi 2009-2010 at College of Horticulture, Rajendranagar, Hyderabad. The objective of the experiment was to identify divergent genotypes to use as donor parents in hybridization programmes.

By Mahalanobis’ D$^2$ statistic, it could be inferred that 1000 seed weight, followed by vitamin C content, capsanthin content, days to maturity and fresh fruit yield per plant contributed maximum towards genetic divergence. Number of fruits per plant and seed content contributed equally followed by fresh fruit weight towards genetic diversity.

The D$^2$ analysis was carried out for 19 characters which partitioned the fifty eight genotypes into eight clusters. Maximum divergence was observed between cluster VII and VIII, while minimum was between cluster III and I. The maximum intra cluster distance was shown by cluster V.

The clusters showing high genetic divergence could be effectively utilized in heterosis breeding programme. If a breeding programme is used at improving the character capsanthin content, cluster VI (IC-572490) showing maximum capsanthin content can be utilized in breeding programme.

The analysis of variance revealed significant differences between genotypes for all the characters. However, there was no significant difference among three checks with respect to three characters viz., number of branches per plant, stem diameter and seed content. Also, there was no significant difference between checks and genotypes for the character, number of primary branches per plant.

On the basis of the mean performance of the genotypes among traits studied, the following were identified as promising lines for further crop improvement in paprika viz. IC-570388 (plant height), IC-572456 (plant spread), EC-599993(PR) (number of branches per plant and capsaicin), EC-599981(fruit length), IC-572472 (fruit pedicel length), EC-599978 (vitamin C content), EC-599992 (stem diameter), IC-57246 (seed content), IC-572490 (capsanthin), IC-572469 (stem length), EC-596940 (early maturity).

Coefficient of variation values indicated considerable amount of variability for all the characters studied except days to 50 % flowering and days to maturity, indicating the scope for selection of suitable initial breeding material for further improvement.

GA as percent of mean, GCV and PCV values are on par with each other for most of the characters that the influence of the environment on the trait(s) was very negligible. The values observed are not confounding with the environment. It is a true reflection of the homeostasis effect or buffer reaction of the gene. Thus, the true reflection of the trait is exhibited.
A true agreement with the GCV and PCV values in the present investigation for the 19 characters was noticed, indicating additive genetic variance governing the high heritability with genetic advance as percent of mean. Thus, a breeder can employ a simple selection process which will be a rewarding one to improve the characters viz., plant height (cm), plant spread (cm), stem length (cm), stem diameter (cm), number of branches per plant, days to 50 per cent flowering, days to maturity, fruit length (cm), fruit width (cm), fruit pedicel length (cm), fresh fruit weight (g), dry fruit weight (g), number of fruits per plant, seed content (%), 1000 seed weight (g), vitamin-C content (mg 100g\(^{-1}\)), capsanthin content (ASTA Units), capsaicin content (%) and fresh fruit yield per plant (g). For number of branches per plant, moderate heritability with high GA as per cent of mean indicates non additive action controlling the traits. Thus, selection for days to 50 per cent flowering may not be rewarding.

From correlation studies it was observed that fruit yield per plant has exhibited highly significant positive association with fresh fruit weight followed by fruit width, dry fruit weight, fruit pedicel length, plant height, number of fruits per plant, stem diameter, fruit length, plant canopy width and 1000 seed weight.

Path analysis revealed that maximum positive direct effect on fruit yield per plant was exhibited fresh fruit weight followed by high positive direct effect of number of fruits per plant, moderate positive direct effect of fruit length and plant height. Vitamin C content exhibited low positive direct effect on fresh fruit yield per plant.

Therefore, it is emphasized to lay attention on traits like fresh fruit weight, number of fruits per plant, fruit length and vitamin C content in crop improvement programme of paprika in future.

79) “standardization of procedures and evaluation of RTS juice and wine from karonda (Carissa carandas L.)” - G.Kalyani.

**ABSTRACT**

A set of two experiments were conducted on “Standardization of procedures and evaluation of RTS juice and wine from karonda (Carissa carandas L.)” at fruit Research Station, Sangareddy, Medak district. All the experiments were carried out in CRD with factorial concept and the treatments were replicated thrice. Various physico-chemical parameters like TSS(ºB), Reducing sugars (%), Total sugars (%), Titrable acidity (%), pH, Alcohol (%), Colour Stability, Ascorbic acid (mg/100 ml), Microbial load (cfu/ml) were analysed during storage period.

In the first experiment, karonda juice was diluted to different dilutions with 10,15, 20 % TSS and stored at room conditions. The treatment 1:5 with 20 % TSS showed highest TSS, reducing sugars and Total sugars, while lowest PH and acidity are recorded. In 1:2 proportion with 10% TSS, lowest TSS, Reducing sugars and Total sugars and highest in pH and acidity were recorded. The overall acceptability of the RTS was good in 1:3 with15% TSS followed by 1:3 with 20% TSS

In the second experiment, karonda wine was prepared with different proportions like 1,1.5, 2 with and without DAHP. During storage TSS, reducing sugars, total sugars, titrable acidity and ascorbic acid were decreased. There was decrease in alcohol content in wine was due to auto-oxidation of ethyl alcohol to aldehydes or combination with volatile acids to form esters. However, maximum alcohol content (8.26%) was recorded in 1:2 dilution with DAHP. In all the treatments, DAHP treated wine showed maximum acidity, alcohol, ascorbic acid and lowest pH, TSS, reducing sugars and total sugars than the treatments without DAHP.
"studies on acceptability and shelflife on value added products developed from aloevera based blends of sapota and guava" - T.Baby Rani

ABSTRACT

A set of experiments were conducted at post harvest technology laboratory, Department of horticulture, College of Horticulture, Rajendranagar, Hyderabad during year 2009.

Most of the fruits and vegetables are seasonal crops and perishable in nature. Some fruits are highly perishable and require immediate processing. Among such fruits include sapota and guava which are common and most important fruits of India. These are highly nutritious and rich flavored fruits but have recorded huge post harvest losses and need to be utilized for processing / value added products.

Aloe, a member of lily family, is a subtropical medicinal plant. Aloe Vera was known to Indians for its medicinal values since time immemorial in the name of “Grit kumari.” It is a kind of evergreen succulent. The mucilage portion of the leaves contain glucose, galactose, mannose, galacturonic acid and protein with 17 amino acids. Aloe has a wide range of medicinal applications such as wound healing effects, reduces blood sugar in diabetes, soothes burns, eases intestinal problems, reduces arthritic swelling, ulcer curative effect, stimulates immune response against cancer, etc.

Initially recipes for value added products like RTS, nectar and squash with sapota and guava were standardized. Blended beverages (RTS, nectar and squash) were prepared by blending aloe with sapota and guava in different proportions. In order to study the storage stability and consumer acceptability, products were stored for a period of three months and were analyzed for total soluble solids, acidity, pH, ascorbic acid, total sugars, reducing sugars, non reducing sugars, antioxidant activity and overall acceptability at monthly intervals.

Slight increase in total soluble solids, pH and total sugar content and a considerable increase in reducing sugars, but slight decrease in acidity, considerable decrease in non reducing sugars, ascorbic acid and antioxidant activity was noticed in all the products of sapota blended with aloe such as RTS, nectar and squash.

In all the products of guava blended with aloe such as RTS, nectar and squash there was a slight increase in total soluble solids, acidity and a considerable increase in reducing sugars but, slight decrease in pH, total sugar content and a considerable decrease in non reducing sugars, ascorbic acid and antioxidant activity noticed during storage for a period of 90 days.

Among all the RTS blends of sapota, sapota and aloe in the ratio 60:40 was rated as superior for quality attributes and acceptability through organoleptic evaluation

Among all the prepared RTS blends of guava, guava and aloe in the ratio of 80:20 was rated the best.

Among all the nectar blends of sapota, sapota and aloe in the ratio of 60:40 was found to be the superior organoleptically.

Among the guava nectar blends, guava and aloe in the ratio of 70:30 was rated as the best.

Among all the prepared squash blends of sapota, sapota and aloe in the ratio of 60:40 was found to be the superior organoleptically.

Among the guava squash blends, guava and aloe in the ratio of 70:30 was rated as the best.

All the products prepared from aloe based sapota and guava were free from the visual microbial growth. This was due to the application of heat, addition of preservative during
processing or might also be due to aloe which has antimicrobial properties. Hence, all the products can be stored without deterioration and can be acceptable up to 3 months.

81) “standardization and storage studies on value added products of ber (Zyziphus mauritiana Lamk.) CV. Gola”- S.Kavitha.

ABSTRACT

The study was divided into three experiments and conducted in the Post Harvest Technology Laboratory, College of Horticulture, Rajendranagar, Hyderabad from December 2008 to February 2009. Investigations were carried out to standardize the recipes for preparation of squash, RTS (Ready to serve) and nectar from ber fruits by using different ratios of pulp and TSS levels at both ambient and low temperature conditions. The products were analyzed at every 30 days interval for their physicochemical, organoleptic characteristics.

TSS content of ber products increased during storage period. Acidity and ascorbic acid of the products were decreased during storage. Total sugars and reducing sugars are increased during storage period and decrease of non-reducing sugars noted. The overall acceptability though it reduced during storage but the products was reasonably stored upto 90 days period. The overall results indicated that ber beverages can store up to 3 months both at ambient and low temperature.


ABSTRACT

The present investigation entitled “Effect of Post-harvest treatments on Shelf-life and ripening of sapota (Acharas zapota L.) fruits cv. Kalipatti” was carried out in the Post Harvest Technology Laboratory, College of Horticulture and Quality Control Lab (ANGRAU), Rajendranagar during the year 2010-2011.

Four experiments were conducted in CRD. Effect of Post harvest application of calcium compounds, growth regulators, packaging materials and chemicals on shelf life and ripening of sapota fruits stored at ambient temperature and cold storage (12°C). The days taken for ripening were increased in fruits. The days taken for ripening was increased in the fruits treated with calcium nitrate and benzyl adenine when compared to control at ambient temperature. The data on quality parameters like PLW, reducing sugars, titrable acidity, TSS also confirm the inhibitory effect on ripening with above treatments.

The total, reducing and non-reducing sugars (%) content increased up to ten days of storage and then declined. Among the respective treatments the highest total, reducing and non-reducing (%) TSS (°B) recorded in fruits treated with both 2 % calcium nitrate and BA 75 ppm.

Sapota fruits packed in polythene bag (100 guage) showed the highest shelf life of 10.67 days. The ripening was increased in Gunny bag with Paddy straw packed fruits.
Post harvest dip treatments of sapota fruits with calcium nitrate (1.5 / 2 %) and BA 75 ppm reduced the rate of oxidative metabolism through retarded catalase activity.

The chemicals from the above experiments namely Calcium nitrate 2.0 %, calcium nitrate 1.5 %, benzyl adenine 75 ppm and gibberelic acid 250 ppm were tried as post harvest dip treatments on sapota fruits and stored at 12°C. Sapota fruits treated with BA 75 ppm and stored at 12°C showed delayed ripening when compared to other treatments.

Sapota fruits treated with BA 75 ppm as post harvest dip recorded the highest shelf life (13.00 days) at ambient temperature and it was 35.34 days when stored at low temperature (12°C).


ABSTRACT

The present investigation entitled “Studies on the effect of holding solutions on the vase life of carnation flowers (Dianthus caryophyllus L.) cv. Charmant” was carried out at Department of Horticulture, College of Horticulture, Andhra Pradesh Horticultural University, Venkataramannagudem, West Godavari Dist. during October 2010 to March 2011. The main objective of the investigation is to find out the efficacy of different preservatives on the post harvest physiology, biochemistry and vase life of cut carnation flowers. A total of four experiments were conducted and all the experiments were laid out in completely randomized design with factorial concept and replicated thrice.

The first experiment consisted of treatments with sucrose at different concentrations. The carnation cut flowers held in sucrose 6 percent vase solution recorded higher values in water uptake, transpirational loss of water and fresh weight of flowers. The same treatment, however, recorded lower values in the electrolyte leakage and microbial count in vase solution. Further, the flowers held in sucrose 6 percent vase solution recorded longer vase life with delayed flower opening and higher chlorophyll content in leaf and calyx.

The second experiment consisted of treatments with ethylene inhibitors and growth regulators (STS, SA and BA) at different concentrations. The cut carnation flowers maintained in vase solution containing STS at 0.25 mM recorded longer vase life with higher values in water uptake, transpirational loss of water and flower diameter. The treatment, benzyl adenine-15 ppm (BA-15) also recorded vase life on par with STS (0.25 mM) with maximum water balance, fresh weight of flower and chlorophyll content in leaf and calyx. Electrolyte leakage, however, was lowest in SA 5.

In third experiment, the treatments were with different biocides (Al₂(SO₄)₃, CaOCl₂, 8-HQS and CA) at varied concentrations. The treatments, 8-HQS 200 ppm and Al₂(SO₄)₃ 150 ppm with higher values in water uptake, transpirational loss of water, water balance, fresh weight of flowers, flower diameter, chlorophyll content in leaf and calyx and lower values in electrolyte leakage recorded longer vase life of carnation cut flowers.
The fourth experiment consisted of treatments with combination of the best in sucrose, ethylene inhibitors, growth regulators and biocides (Sucrose 6 percent, STS 0.25 mM, BA 15 ppm, 8-HQS 200 ppm and \( \text{Al}_2(\text{SO}_4)_3 \) 150 ppm). The carnation cut flowers held in vase solution containing sucrose, ethylene inhibitor and biocide (Sucrose 6 per cent + STS 0.25 mM + \( \text{Al}_2(\text{SO}_4)_3 \) 150 ppm) recorded a longer vase life by registering higher values in water uptake, transpirational loss of water and fresh flower weight. The other factors contributed to the longer vase life of carnation cut flowers with the treatment were lower electrolyte leakage and delayed opening of flowers.

84) “Heterosis And Combining Ability Studies For Yield And Its Components In Bottle Gourd (Lagenaria siceraria (Mol.) Standl.)”- V.Vijay Kumar.

**ABSTRACT**

The present investigation entitled was undertaken to estimate levels of heterosis, gene action and combining ability effects for vine yield and its component characters in bottle gourd. The experimental material comprised of 12 genotypes including eight lines, namely, LS-50, LS-16, LS-41, LS-10, LS-45, LS-46, LS-34 and LS-62-1; three testers, namely, LS-20, LS-7 and PSPL; and one Standard check namely Arka Bahar. The selected parents were raised and crosses were effected in a line x tester fashion and the resultant \( F_1 \)s, parents and the check Arka Bahar were sown in a randomized block design with two replications during spring summer season of 2009 at the college Farm, college of Agriculture, Rajendranagar, Hyderabad and evaluated for genetic parameters, heterosis and combining ability for the yield and yield component characters.

Analysis of variance revealed the existence of significant differences among the genotypes for all the traits studied, indicating the existence of sufficient variation for effective selection. The hybrids, in general were early maturing and high yielding with high fruit number/vine, fruit weight, length and girth in addition to greater number of branches per vine, compared to the parents. Maximum yield levels were recorded for the hybrid LS-34 x LS-7 followed by LS-34 x LS-20. LS-34 among lines and LS-7 and LS-20 among testers were observed to be superior to the standard check, Arka Bahar with regards to vine yield and other important yield component characters.

High genotypic and phenotypic coefficients of variation, heritability and genetic advance were noticed for the traits viz., vine length, node of first female flower, branches per vine, fruits per vine, fruit girth, fruit weight and vine yield, indicating the effectiveness of direct selection for these traits. However, moderate values were noticed for fruit length, while, days to first female flower and days to first harvest had recorded low values indicating the need for adoption of indirect selection procedures for improvement of these traits.

Existence of significant levels of heterosis for yield and yield component characters was observed in the experimental material studied. The highest value of standard heterosis for vine yield was observed for LS-34 x LS-7 (55.15%), followed by LS-34 x LS-20 (47.49%) and LS-45 x LS-7 (44.01%). Positive and significant heterosis more than 10 per cent for vine yield was recorded for the hybrids, LS-10 x PSPL, LS-16 x PSPL, LS-34 x LS-7, LS-34 x LS-20, LS-34 x PSPL, LS-45 x LS-7, LS-45 x LS-20 and LS-45 x PSPL uniformly over mid parent, better parent and the standard check, Arka Bahar indicating their potential for commercial
exploitation. Among these, LS-10 x PSPL, LS-16 x PSPL, LS-34 x LS-7 and LS-45 x PSPL had also recorded desirable and significant negative heterosis for days to first harvest, uniformly over mid parent, better parent and the standard check, Arka Bahar indicating their scope for promotion as early and high yielding hybrids.

The estimates of components of variance and their ratio revealed a greater magnitude of SCA variance, compared to GCA variance for all the traits studied, indicating the preponderance of non-additive gene action and a scope for improvement of the traits through heterosis breeding. An analysis of the general combining ability effects revealed the lines, LS-10, LS-16, LS-34 and LS-45; and the tester, LS-7 to be good general combiners for vine yield. Among these, LS-34 and LS-45 lines and LS-7 tester had recorded high per se performance for the trait and hybrid combinations involving these parents were also observed to result in high yielding and heterotic hybrids, indicating their potential in the crop breeding programmes aimed at the development of high yielding hybrids and varieties. The line, LS-34 was also observed to be a good general combiner for fruit weight, fruit length, fruits per vine and days to first female flower, while LS-45 was also noticed to be a good general combiner for fruit weight, fruit girth, fruit length, fruits per vine, branches per vine, node of first female flower and days to first harvest indicating a scope for simultaneous improvement of the above traits with utilization of these lines in the crop breeding programmes. Similarly, the tester, LS-7 was noticed to be a good general combiner for fruit weight and fruit girth, in addition to vine yield.

An analysis of specific combining ability effects of the hybrids revealed LS-10 x LS-7, LS-16 x LS-7, LS-16 x LS-20, LS-34 x LS-7, LS-34 x LS-20, LS-34 x PSPL, LS-45 x LS-7 and LS-45 x LS-20 hybrids to be good specific combiners for vine yield. These hybrids had also recorded high per se performance for the character. Among these, LS-34 x LS-7, LS-34 x LS-20, LS-34 x PSPL, LS-45 x LS-7 and LS-45 x LS-20 hybrids had also recorded high heterosis (>10%) over mid-parent, better parent and the standard check, namely, Arka Bahar and hence, are identified as potential high yielding hybrid combinations and may be utilized for commercial exploitation after extensive testing for stability in performance.

85) “Studies on dilution of sweet orange juice and use of yeast strains for preparation of vermouth” –Kadam Ganesh. D.

ABSTRACT

An experiment entitled “Studies on dilution of sweet orange juice and use of yeast strains for preparation of vermouth” was conducted at College of Horticulture, APHU, Rajendranagar, Hyderabad during 2010-11. The experiment consists of six treatments Viz. (i) T1-(1:0 dilution with yeast strain 1), (ii) T2-(1:0 dilution with yeast strain 2), (iii) T3-(1:0.5 dilution with yeast strain 1), (iv) T4-(1:0.5 dilution with yeast strain 2), (v) T5-(1:1 dilution with yeast strain 1) and (vi) T6-(1:1 dilution with yeast strain 2) replicated thrice with CRD (Completely Randomized Design) with factorial concept.

The aim of experiment was (i) to standardize the dilution of sweet orange juice for vermouth preparation, (ii) to standardize the starter for preparation of sweet orange vermouth, (iii) to study the compositional changes in base wine during fermentation and (iv) to study the compositional changes in sweet orange vermouth during maturation.
The extracted juice of sweet orange fruit diluted as per the treatments and inoculated with yeast strains Viz. (i) *Saccharomyces cerevisiae* var. *ellipsoideus* and (ii) *Saccharomyces cerevisiae* var. MTCC 172 for start the fermentation of sweet orange must. The fermentation was completed in 13 days with treatment $T_3$ (1:0.5 dilution with yeast strain 1) and it produced alcohol of 7.99% in base wine. In the processes of fermentation the TSS, reducing sugars and total sugars got reduced with increase in titrable acidity. The optimum pH of sweet orange must could be 4.6 which hasten the rate of fermentation.

The dilution of sweet orange juice in the ratio of 1:0.5 was found to be optimum since it had completed the process fermentation within 13 days with yeast strain *Saccharomyces cerevisiae* var. *ellipsoideus* and also had higher % of alcohol.

The spice and herb extract (1:1 ratio of base wine and brandy added to spices and herbs) were added to the base wine called ‘vermouth’ and were allowed for the maturation for a period of 90days.

The alcohol content during the maturation of vermouth slightly increased due to addition of sweet orange brandy upto 60 days thereafter it did not differ.

The treatment $T_3$ (1:0.5 dilution with yeast strain 1) recorded significantly lower phenols (156.50 µg/ml), tannins (0.015%), TSS (4.89 B), reducing sugars (2.25%) and total sugars (4.11%) with an alcohol content of 15.09%.


**ABSTRACT**

An experiment was carried out during the kharif 2010 at Horticultural Research Station, APHU, Venkataramannagudem, West Godavari district, Andhra Pradesh to study the response of different organic (FYM, poultry manure and vermicompost) and inorganic (urea, SSP and MOP) sources of nutrients in combination with biofertilizers (*Rhizobium, PSB*) on growth, pod yield and quality of cluster bean (*Cyamopsis tetragonoloba* L. Taub) var. Pusa Sadabahar. Experiment was laid out in a randomized block design (RBD) with three replications and data on growth (plant height, number of leaves and leaf area plant$^{-1}$), pod yield (pod yield plant$^{-1}$) and its attributes (pod clusters plant$^{-1}$, pods cluster$^{-1}$, length and diameter of pod) and pod quality( protein and crude fibre contents and shelf life) were recorded.

Morphological characters like plant height, number of leaves plant$^{-1}$, leaf area plant$^{-1}$ at all stages of plant growth were significantly increased with the application of 75% recommended dose of nitrogen (RDN) through inorganic fertilizers and 25% RDN through poultry manure along with biofertilizers (*Rhizobium + PSB*) over other treatment combinations whereas, application of 25% RDN through inorganic fertilizers and 75% RDN through FYM along with biofertilizers has recorded poor growth at all the crop stages over other treatments. Plants that received 100% RDF +*Rhizobium* shown early flowering and took shorter crop
duration than other combinations, while, application of 25% RDN through chemical fertilizers+75% RDN through FYM+ biofertilizers taken more days for flowering and recorded longer crop duration.

Yield components viz., number of clusters plant⁻¹, number of pods in a cluster, length and diameter of pod and number of seeds pod⁻¹ differed significantly due to the different INM practices. Among the treatments, application of 75% RDN through inorganic fertilizers and 25% RDN through poultry manure along with biofertilizers has recorded higher pod yield (50.21 g plant⁻¹), while 25% RDN through inorganic fertilizers + 75% RDN through FYM+ biofertilizers recorded lower pod yield (37.62 g plant⁻¹). Protein content (3.63 %) in pods was higher with the application of 75% RDN through inorganic fertilizers + 25% RDN through poultry manure + biofertilizers. while, lesser crude fibre content (2.18 %) and higher shelf life of pods (5.62 days) was observed in pods obtained from plant that received 25% RDN through inorganic fertilizers + 75% RDN through poultry manure + biofertilizers.

Higher gross returns (Rs 78, 720.00 ha⁻¹) and benefit: cost ratio (1: 2.02) were recorded with the application of 75% RDN through inorganic fertilizers + 25% RDN through poultry manure+ biofertilizers and followed by 100% RDF + Rhizobium.

Hence, application of poultry manure (equivalent weight of 25% recommended dose of nitrogen) + 75% RDN through chemical fertilizers along with Rhizobium and PSB can be recommended for profitable cultivation of cluster bean crop along with optimum quality in coastal region of Andhra Pradesh.

87)“Studies on morphological characterization, variability, heritability and genetic advance in betelvine (Piper betle Linn.)”- S.Gopi Priya

ABSTRACT

The present investigation entitled “Studies on morphological characterization, variability, heritability and genetic advance in betelvine (Piper betle Linn.)” was carried out during 2010-2011 at AICRP on Medicinal and Aromatic Plants & Betelvine, Venkataramannagudem, Andhra Pradesh Horticulture University, West Godavari District, Andhra Pradesh.

The present study was conducted with forty betelvine genotypes for seventeen characters, of which three were morphological characters viz., leaf colour, internodal colour, orientation of petiole and one qualitative character i.e., keeping quality. Quantitative characters were thirteen, which include plant height, number of laterals, petiole length, internodal length, diameter of the stem, leaf area, R-value, leaf area index, specific leaf weight, main veinlet number, number of harvestable leaves per vine, fresh and dry weights of 100 leaves. The experiment was conducted in augmented design with thirty six genotypes and four check varieties. The four check genotypes were replicated six times after each row of six genotypes. The check varieties include Swarna Kapoori, Tellaku Ponnuru, Black leaf and Karapaku, of which the former two genotypes belong to Kapoori group while, the latter two genotypes belong to Bangla group. The study was conducted to document information on morphological characterization, variability,
heritability and genetic advance characters. Correlation studies were also carried out between yield and yield attributing characters.

The study revealed that both the groups exhibited diversity in exomorphic characters during the first year of crop growth at 60, 120 and 180 days after planting. Data revealed that traits like plant height, number of laterals and number of harvestable leaves per vine contributed maximum for leaf yield in Kapoori group over Bangla group. Among all the genotypes studied, the check Swarna Kapoori recorded the highest yield and is found suitable to the local agro-climatic conditions.

Significant variability was observed for all the seventeen characters under study. Among the characters studied, number of laterals and leaf area index showed higher GCV and PCV at all the three stages of observation i.e., at 60, 120 and 180 DAP, evincing more scope for the improvement through selection.

The heritability estimates were high for most of the characters under consideration like plant height, petiole length, internodal length, leaf area, leaf area index, specific leaf weight, fresh weight of 100-leaves and dry weight of 100-leaves at all the three stages i.e., 60, 120 and 180 DAP indicating the scope for effective selection for further breeding programmes.

Genetic advance as per cent of mean were high for the characters like plant height, number of laterals, leaf area, leaf area index, specific leaf weight, fresh weight and dry weights of 100-leaves at all the three stages i.e., 60, 120 and 180 DAP indicating that these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

The studies on character association showed that number of harvestable leaves per vine had positive correlation with traits like plant height, number of laterals, leaf area, leaf area index and fresh weight of 100-leaves signifying the importance of these traits in selection for yield and can be identified as yield attributing traits for the genetic improvement of yield in betelvine.


ABSTRACT

The present investigation “Effect of micronutrients on growth, yield and quality of tomato (Solanum lycopersicum L.)” was carried out during rabi 2010-11 at Vegetable Research Station, Rajendranagar, Hyderabad. The treatments included frequency of application of micronutrients at different levels of concentrations. The experiment was laid out in randomized block design with 13 treatments and three replications.

The study revealed that the application of 0.50 % micronutrient mixture(B, Cu, Fe, Mn, Mo and Zn) recorded the maximum plant height which was followed by 0.50 % ZnSO₄. The leaf area and the number of branches were highest with the sprays of 0.50 % of micronutrient mixture followed by the treatment 0.50 % H₃BO₄.
Days to flower initiation and days to 50% flowering recorded lesser number of days in 0.50% micronutrient mixture treatment. It was followed by 0.50% H$_3$BO$_4$ and 0.50% ZnSO$_4$. For the number of flowers per cluster, 0.50% micronutrient mixture recorded maximum average number of flowers per cluster. It was followed by 0.50% H$_3$BO$_4$ and 0.50% ZnSO$_4$ treatments.

Weight of fruit was maximum with the application of 0.50% micronutrient mixture which was on par with 0.50% FeSO$_4$ whereas, the length of the fruit, diameter of the fruit and pericarp thickness of fruit recorded maximum in 0.50% micronutrient mixture. It was followed by 0.50% H$_3$BO$_4$.

The number of fruits per cluster recorded highest in the 0.50% micronutrient mixture spray which was followed by 0.50% H$_3$BO$_4$ and 0.50% ZnSO$_4$.

Yield per plant, yield per plot and yield per hectare were maximum in the treatment 0.50% micronutrient mixture. It was followed by the treatment 0.50% of H$_3$BO$_4$.

The highest total soluble solid was recorded in the treatment 0.50% micronutrient mixture. It was followed by the treatments 0.50% of H$_3$BO$_4$ and 0.50% of ZnSO$_4$. The highest ascorbic acid content was recorded in the treatment 0.50% micronutrient mixture. It was followed by the treatments 0.50% of CuSO$_4$ and 0.50% of ZnSO$_4$. The maximum shelf life was recorded in the treatment 0.50% micronutrient mixtures. It was followed by the treatments 0.50% of H$_3$BO$_4$ and 0.50% of ZnSO$_4$.

The best economic cost benefit ratio (1:1.80) was recorded in the treatment 0.50% micronutrient mixture. The treatment 0.50% H$_3$BO$_4$ (1:1.62) also showed favourable economic cost benefit ratio. The cost benefit ratio was economically very less in the control (1:1.29).

89) “Effect of different levels of nitrogen fertilization and growth retardants on growth and yield of China aster (Callistephus chinensis L. Nees)”- L.Rupa.

**ABSTRACT**

A field experiment, “Effect of different levels of nitrogen fertilization and growth retardants on growth and yield of China aster (Callistephus chinensis L. Nees),” was conducted at College of Horticulture, Andhra Pradesh Horticulture University, Rajendranagar, Hyderabad during the year 2009-10. The experiment was laid out in Split plot design comprising twenty one treatments, with main treatment as nitrogen fertilization consisting of three nitrogen levels- 120 kg N/ha, 150 kg N/ha and 180 kg N/ha; sub-treatments as growth retardants (CCC and MH) consisting of seven
concentrations - water spray, CCC 2000 ppm, CCC 2200 ppm, CCC 2400 ppm, MH 500 ppm, MH 1000 ppm and MH 1500 ppm. The entire treatments were replicated thrice.

The results of the experiment revealed that the china aster plants supplied with 180 kg N/ha showed superiority in plant characters viz., plant height, number of branches, internodal length, number of leaves, leaf area, leaf area index and dry matter accumulation.

Reduced plant height, highest number of branches, number of leaves and dry matter accumulation were recorded by CCC 2400 ppm. Highest number of branches, minimum internodal length, leaf area and leaf area index are reported with MH 1500 ppm.

With respect to floral characters earlyness in flower bud initiation and 50% flowering were obtained with 120 kg N/ha. Where as 180 kg N/ha recorded maximum number of flowers per plant, diameter of flower, 100 flowers weight, stalk length, flower yield per plant and flower yield per plot. Longest vase life was obtained with 120 kg N/ha.

CCC 2400 ppm treatment showed delay in flower bud initiation, 50% flowering, highest number of flowers per plant and smallest flowers. But highest flower weight and yield per plant and plot were recorded with CCC 2200 ppm. and for the yield per plot CCC 2000 ppm and MH 1500 ppm are at on par with CCC 2200 ppm.

MH 1500 ppm treated plants showed extended flowering period, reduced stalk length and longer vase life.

180 kg N/ha and CCC 2400 ppm both expressed highest values for the biochemical parameters i.e. nitrogen content, nitrogen uptake and nitrate reductase activity.

90) “Effect Of Anti Softening And Anti Browning Chemicals On Storage And Quality Of Fresh Cut Mangoes”- G.Kalpana.

ABSTRACT

A Set of 4 experiments on the effects of anti softening (calcium chloride 1 % and 2 %) and anti browning chemicals (ascorbic acid 1 % and 2 %) individually and in combinations (best of anti softening and anti browning) on the browning and shelf life and quality of fresh cut mango cubes of cv Baneshan and Totapari stored at different temperatures (ambient conditions, at 10°C and 5°C) was conducted at Horticultural research station, Sangareddy. In all the experiments, the design followed in Completely Randomized design with Factorial concept with three replications per treatment. Various physical parameters like browning index, shelf life (in days) , organoleptic evaluation and biochemical parameters like TSS (° Brix), titrable acidity, reducing sugars, total sugars, total phenols and ascorbic acid were estimated at regular intervals during the storage in all
the experiments. The fruit cubes were analyzed on alternate day interval for their browning index, physicochemical and organoleptic characteristics.

Mango fruit of cv. Baneshan and Totapari were cut and treated with different chemicals and stored at different temperatures. At ambient temperatures, calcium chloride 2% and ascorbic acid 2% were found to be effective in reducing the browning index and recorded increased total phenols when compared to lower concentrations and untreated controls of mango cubes of both cv. Baneshan and Totapari. However, at ambient temperatures the mango cubes has a shelf life of less than two days in both the mango cultivars. The best anti softening (calcium 2%) and anti browning chemical (ascorbic acid 2%) based on the reduction of browning index in the mango fruit cubes of cv. Baneshan and Totapari of first 2 experiments were used individually and in combinations and stored at 10°C and 5°C in 3rd and 4th experiment respectively.

At 10°C and 5°C, maximum shelf life of 10 days and 16 days respectively was observed in the mango fruit cubes of Totapari treated with combination of calcium 2% and ascorbic acid 2%. At low temperatures, mango fruit cubes of cv. Totapari have lowest browning and highest shelf life when compared to the cv. Baneshan. The combination treatment was more effective in reducing the browning index. The treatments which improved the shelf life have recorded lowest browning index. Highest total phenols were observed in the treatments which recorded lowest browning index and subsequently increased the shelf life irrespective of storage temperatures and mango variety tested. Highest total phenols indicate the lowest polyphenol oxidase enzymatic activity and thereby resulting in reducing browning effect in the treated fruit cubes. Further highest ascorbic acid content was observed in the fruit cubes which were treated with ascorbic acid 2% individually or in combinations irrespective of the variety and storage temperatures. The TSS increased during storage of the fruit cubes during the storage period irrespective of the storage temperatures and varieties. However, the increase in sugars both reducing and non reducing sugars were slow when the fruit cubes stored at low temperatures indication and otherwise delayed ripening. The fruit cubes treated with calcium chloride 2% and ascorbic acid 2% recorded maximum organoleptic score irrespective of storage temperatures.


ABSTRACT

The present investigation entitled “Studies on the effect of growth regulators and micronutrients on growth and yield of okra (Abelmoschus esculentus (L.) Moench) cv Arka Anamika” was carried out during the kharif, 2011 at Horticultural College and Research Institute, Venkataramannagudem. The studies were carried out with 13 different treatments involving three growth regulators (GA₃, NAA and triacontanol) and three micronutrients (ZnSO₄, FeSO₄ and Borax), at two different concentrations sprayed at 20 and 40 DAS. The experiment was laid out in a randomized block design (RBD) with three replications and data on effect of different growth regulators and
micronutrients on growth, yield, yield attributes and nutrient uptake was recorded and statistically analyzed.

Among the treatments GA$_3$ at 50 (T$_2$) ppm had resulted in maximum plant height (111.0 cm), minimum number of days to 50 per cent flowering (36.6) and highest number of nodes per plant at harvest (26.7), minimum number of days to first picking (42.6), increased number of days to final picking (84) and highest number of fruits per plant (22.6) compared to other treatments.

In case of yield attributes, the highest fruit length (25.5 cm) was recorded with triacontanol 4000 ppm, followed by triacontanol 2000 ppm (24.8 cm) and GA$_3$ 50 ppm (24.3 cm). Among the micronutrients, FeSO$_4$ 0.2% recorded maximum fruit length (19.8 cm) followed by ZnSO$_4$ 0.4% (19.4 cm). The highest fruit diameter (7.5 cm) was recorded with NAA 20 ppm followed by borax 0.2% (7.3 cm).

The highest fruit weight (23.8 g) was recorded with GA$_3$ 50 ppm followed by ZnSO$_4$ 0.4% (22.8 g). The GA$_3$ 50 ppm and triacontanol 4000 ppm recorded highest number of seeds per fruit (54.3) followed by FeSO$_4$ 0.4% (48.3) and ZnSO$_4$ 0.4% (48.3).

All the treatments showed increased the fruit yield per plant, fruit yield per plot and fruit yield per hectare compared to control. Among the treatments, GA$_3$ 50 ppm recorded the highest fruit yield per plant (452.4 g), fruit yield per plot (16.19 kg) and fruit yield per hectare (199.9 q) followed by GA$_3$ 25 ppm (373.2 g, 13.5 kg and 166.8 q). Among the micronutrients, FeSO$_4$ 0.4 % recorded the highest fruit yield per plant (290.8 g), fruit yield per plot (10.51 kg) and fruit yield per hectare (129.8 q) followed by FeSO$_4$ 0.2% (284.0 g, 10.07 kg and 124.4 q) respectively.

Irrespective of growth regulators and micronutrients and their concentrations all the treatments recorded superior B: C ratios over the control. The highest benefit: cost ratio (5.06) was obtained with GA$_3$ 50 ppm followed by GA$_3$ 25 ppm (4.10) and triacontanol 4000 ppm (3.77).

All the treatments invariably enhanced the uptake of nitrogen, phosphorus and potassium over the control. Among the treatments, the highest nitrogen uptake (83.3 kg/ha) and potassium uptake (40.6 kg/ha) was observed in plants sprayed with triacontanol 4000 ppm, followed by GA$_3$ 50 ppm (81.6 kg/ha and 39.6 kg/ha) respectively. The highest phosphorus uptake (22.9 kg/ha) was observed with GA$_3$ 50 ppm, followed by triacontanol 4000 ppm (22.6 kg/ha).

92) “Studies on the effect of type of cuttings and IBA concentrations on the propagation of Fig (Ficus carica) cv. Poona fig under open and polyhouse conditions.”- Sivaji Thota.

**ABSTRACT**

The present experiment entitled “Studies on the effect of type of cuttings and IBA concentrations on the propagation of Fig (Ficus carica) cv. Poona fig under open and polyhouse conditions.” were carried out during 2011-2012 at Horticultural College & Research institute, Dr. Y.S.R. Horticulture University, Venkataramannagudem, West Godavari district.
The present experiment was designed to study the effect of type of cuttings namely basal, middle, apical cuttings and different IBA concentrations at 1000 ppm, 2000 ppm, 3000 ppm in open and polyhouse conditions on days to first sprouting, root and shoot parameters and establishment percent in open field conditions with nine treatments and three replications in Factorial Randomized Block Design.

Among the type of cuttings, apical cuttings recorded minimum number of days for sprouting and basal cuttings recorded maximum rooting and shooting parameters like percentage of rooted cuttings, survival percentage of rooted cuttings, number of roots, length of longest root, root fresh and dry weight, number of shoots per cutting, number of leaves per shoot, length of the longest shoot at 30, 60 and 90 DAP, shoot fresh and dry weight, leaf area per cutting and establishment percentage of rooted cuttings in open field conditions in both open and polyhouse conditions.

Of all the IBA concentrations used, IBA 3000 ppm recorded minimum number of days for sprouting, maximum rooting and shooting parameters like percentage of rooted cuttings, survival percentage of rooted cuttings, number of roots, length of longest root, root fresh and dry weight, number of shoots per cutting, number of leaves per shoot, length of the longest shoot at 30, 60 and 90 DAP, shoot fresh and dry weight, leaf area per cutting and establishment percentage of rooted cuttings in open field conditions in both open and polyhouse conditions.

Among the treatment combinations, basal cuttings treated with 3000 ppm recorded maximum rooting and shooting parameters like percentage of rooted cuttings, survival percentage of rooted cuttings, number of roots, length of longest root, root fresh and dry weight, number of shoots per cutting, number of leaves per shoot, length of the longest shoot at 30, 60 and 90 DAP, shoot fresh and dry weight, leaf area per cutting and establishment percentage of rooted cuttings in open field conditions in both open and polyhouse conditions.

Between open and polyhouse conditions, open conditions recorded minimum number of days for sprouting, maximum rooting parameters, establishment percent than cuttings grown under polyhouse conditions. Cuttings grown under polyhouse recorded maximum shooting parameters than open conditions.

It was found that basal cutting treated with IBA 3000 ppm grown in open environmental conditions is best for propagation of fig by cuttings.

93)“Performance of Different Varieties of African Marigold (Tagetes erecta L.) at Different Levels of Nitrogen ”- Y.Nayomi Namratha.

ABSTRACT

The present experiment entitled “Performance of Different Varieties of African Marigold (Tagetes erecta L.) at Different Levels of Nitrogen” was undertaken at college farm of Horticultural College and Research Institute (HCRI), Venkataramannagudem, West Godavari district during Rabi of 2011-2012.

The experiment was carried out with 12 different treatments in a randomized block design (RBD) with factorial concept with three replications. The treatments include three varieties of marigold i.e. Pusa Narangi Gainda, Pusa Basanthi Gainda and
V. R. Gudem Local at four levels of nitrogen i.e. control, 150 kg/ha, 300 kg/ha, 450 kg/ha. The data were recorded and statistically analysed to find out the effect of different treatments on the vegetative characters, flower characters, yield parameters, vase life, along with nitrogen uptake in different treatments.

Among the vegetative characters Pusa Basanthi Gainda with the application of 450 kg/ha ($T_2N_3$) recorded maximum plant height (77.85 cm). However, highest number of primary (36.87) and secondary (59.92) branches and maximum plant spread (E-W - 62.26 cm N-S - 62.12 cm) was recorded Pusa Narangi Gainda at the same dose of nitrogen ($T_1N_3$).

Among the flower characters, Pusa Narangi Gainda has recorded minimum number of days taken for 50 per cent bud initiation (31.10), 50 per cent flowering (42.70) and first picking (42.38) without nitrogen. However the number of flower per plant (82.43), days taken for last picking (130.84), number of pickings (11.49) and the duration of flowering (68.70) were maximum in Pusa Narangi Gainda with 450 kg/ha. On the other hand, flower diameter (9.35 cm) and weight of 100 flowers (2576.31 g) was maximum in Local variety with 450 kg /ha ($T_3N_3$).

In case of yield parameters, Pusa Narangi Gainda with 450 kg/ha ($T_1N_3$) has recorded maximum yield per plant (1276.61 g), yield per plot (18.54 kg) and yield per hectare (299.48 t).

Maximum shelf life (7.33 days) was recorded in Pusa Narangi Gainda when no nitrogen was applied ($T_1N_0$). But nitrogen uptake (320.20 kg) was recorded maximum in the treatment $T_1N_3$ i.e. Pusa Narangi Gainda with 450 kg/ha ($T_1N_3$).


**ABSTRACT**

The present experiment entitled “Evaluation of Chrysanthemum (*Dendranthema grandiflora* Tzvelev) cultivars in alfisols of coastal Andhra Pradesh” was conducted at Horticultural College and Research Institute (HCRI), Venkataramanagudem, West Godavari district during 2011-2012. in field experiment, fifteen chrysanthemum cultivars were evaluated for growth and flower yield potential.

During evaluation studies with fifteen cultivars, positive and significant variations were observed for growth, flowering and yield. Among the varieties, maximum plant height was observed in Cv. Geethanjali, While the Cv. Aparijitha recorded maximum plant spread and number of primary branches per plant.

Days taken for flower bud initiation and days taken to 50 per cent flowering varied significantly with the varieties. Local check was early to flower, whereas Cv. Red Stone was late to flower and Cv Punjab Gold ahs taken more number of days to 50 per cent flowering. Duration of flowering was maximum for local check and minimum for Cv. Aarijitha. Local check took less number days to first and final harvest which was on par with Cv. Meera.
Among the fifteen cultivars of chrysanthemum evaluated, seven were yellow in colour, three were red in colour, two were white in colour and the remaining three were lemon yellow, pinkish cream and purple in colour. The cultivars Meera and Aparitjitha had more number of flowers per plant and Cv. Aparijitha significantly superceeded the other varieties by recording more yield per plant and hectare. All the cultivars tested and better shelf life and vase life. Life compared to local check. Cv. Jaya recorded maximum shelf life and vase life.

In genetic studies, high genotypic and phenotypic coefficient of variation, heritability and genetic advance as per cent of mean was observed with number of flowers per plant, stalk length, flower disc diameter, number of ray florets per head, flower weight and flower yield per plant. In correlation studies, significant positive association of yield per plant was observed with number of flowers per plant, flower diameters, stalk length and number of ray florets yield of chrysanthemum. In path first ranking components of flower yield in chrysanthemum were number of ray florets per head, number flowers per plant and flower weight as these characters directly influence the flower yield.

Thus, practical and promisable inference could be drawn from the experimentation for selecting suitable chrysanthemum cultivars. Selecting the cultivars like Aparijitha, Jaya and Red Stone hold a promising preference for the growth and flowering. Further, Cv. Jaya is also having better shelf life and vase life. Improvement of characters like numbers of flow4rs per plant, flower diameter, stalk length and number of ray florets per head will be useful in improving the yield of chrysanthemum flower  


ABSTRACT

The present investigation entitled “STUDIES ON THE EFFECT OF PLANT DENSITIES AND NITROGEN LEVELS ON GROWTH AND CURD YIELD OF CAULIFLOWER (Brassica oleracea var. botrytis L.) cv. PUSA SHARAD” was carried out in Rabi 2011-2012 at Horticultural College and Research Institute, Venkataramannagudem, Dr. Y. S. R. Horticultural University, West Godavari (Dist.).

The present study included 9 treatment combinations each replicated thrice in Factorial Randomized Block Design. The treatment combinations included three levels of plant densities (49,383 plants per ha, 37,037 plants per ha and 27,778 plants per ha) and three levels of nitrogen (100 kg/ha, 200 kg/ha and 300 kg/ha).

The results revealed that the cauliflower cv. Pusa Sharad responded well to plant densities as well as nitrogen levels. The vegetative parameter like plant height was favorably influenced by high density planting (D₁) and a nitrogen level of 300 kg/ha (N₃). Whereas, other characters like number of leaves per plant (30, and 60 DAT and at harvest), leaf area (at 30 and 60 DAT and at harvest) and plant spread (30 and 60 DAT and at harvest) were recorded maximum with lower plant density (D₃) and higher nitrogen level (N₃). The number of days taken to first curd appearance and maturity were found to be minimum with high plant density
(D₁) and lower dose of nitrogen (N₁). The minimum per cent of abnormal curds was found with lower plant density (D₃) and higher dose of nitrogen (N₃).

The yield and yield attributing characters like curd diameter, curd weight showed better expression with lower plant density (D₃) and higher dose of nitrogen (N₃). However, the curd yield per plot and hectare were found significantly superior with the high density planting (D₁) and higher dose of nitrogen (N₃).

The interaction effect of plant densities and nitrogen levels were found non-significant with plant height (at 30 DAT), days to first curd appearance and maturity and N uptake. Significant differences were observed in plant height (at 60 DAT and harvest) and curd yield per plot and hectare, net returns and B: C ratio with the treatment combination of D₁N₃. However, number of leaves (at 30 and 60 DAT and at harvest), leaf area (at 30 and 60 DAT and at harvest), plant spread (at 30 and 60 DAT and at harvest), curd diameter and curd weight were found to be significant with treatment combination of D₃N₃. The maximum per cent of abnormal curds was observed with treatment combination of D₁N₁.

96) “Studies on growth, yield and quality of different cultivars of banana in Andhra Pradesh”- K.Ganga Raju.

ABSTRACT

The present investigation entitled “Studies on growth, yield and quality of different cultivars of banana in Andhra Pradesh” was conducted at Horticulture Research Station, Kovvur, West Godavari during 2010-11. The objective of the experiment is to recommend a suitable cultivar with higher yield, quality and shelf life for commercial cultivation in coastal areas of Andhra Pradesh. In field experiment, eight banana cultivars viz., Dwarf Cavendish, Robusta, Grand Naine, Martman, Tella Chakkerakeli, KBS-01, Yangambi Km-5 and Karpura Chakkerakeli were evaluated for growth and yield potential. The data collected from this experiment was further utilized for the genetic analysis viz., PCV, GCV, Correlation studies and Path coefficient analysis.

Among the cultivars of banana evaluated, the maximum plant height and pseudostem girth was recorded in Martman at shooting stage, the higher number of suckers were observed in Dwarf Cavendish, whereas the total leaves production was highest in Martman followed by Grand Naine, similarly green leaves were higher in Martman followed by Dwarf Cavendish. Leaf area was significantly highest in Martman followed by Tella Chakkerakeli and Karpura Chakkerakeli. The early shooting was observed in Dwarf Cavendish whereas late shooting was recorded in Martman and also same trend was observed in days taken to harvest. The growth rate for plant height was maximum at early stage of crop growth in KBS-01. With regards to LAI, Martman recorded the highest value.

Regarding to yield attributes, the maximum bunch weight and yield was recorded in Grand Naine. The number of hands per bunch and fingers in 2nd hand were higher in Karpura Chakkerakeli and Yangambi Km-5 respectively, whereas finger length and finger girth were highest in Grand Naine. With respects to the quality, Tella Chakkerakeli recorded significantly higher to characters viz., TSS, total sugar content and reducing sugar
content, but it had less shelf life. Comparatively the highest shelf life was recorded in Grand Naine.

In genetic studies, high Genotypic and Phenotypic coefficient of Variation, heritability and genetic advance as per cent mean were observed in leaf area, bunch weight and yield per plant. In correlation studies, significant positive association of yield per plant was observed with bunch weight, number of hands per bunch, fingers in 2\textsuperscript{nd} hand and finger length at the genotypic and phenotypic level. Therefore improvement of these characters might be helpful in improving the yield in banana. With regards to Path coefficient analysis, the first ranking components of yield of banana were bunch weight, number of hands per bunch, fingers in 2\textsuperscript{nd} hand as these characters directly influenced the bunch yield.

In banana, on basis of results obtained in the present investigation among eight cultivars of AAA and AAB genomic groups tested, Grand Naine recorded highest yield followed by Martman and Robusta. The variety, Grand Naine also recorded higher values for yield attributing characters such as bunch weight, number of hands per bunch and number of fingers in hand with longer shelf life. Therefore, above cultivar can be recommended for commercial cultivation in coastal areas of Andhra Pradesh.

97) “Studies on genetic variability, correlation, path analysis and divergence in brinjal genotypes (Solanum melongena L.)”- P. Vindya Rani.

ABSTRACT

The experiment entitled, “Studies on genetic variability, correlation, path analysis and divergence in brinjal genotypes (Solanum melongena L.)” was carried out during 2011-2012 at Horticultural Research Station, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The present study was conducted with forty genotypes of brinjal along with four local checks Gulabi, Bhagyamati, Improved Bhagyamati and Arka Kesav in Randomized Block Design with two replications to study the genetic variability, heritability, genetic advance, correlation, path coefficient analysis and divergence for quantitative characters.

The study revealed significant differences among genotypes for different characters studied. Among all the genotypes studied, the check variety Gulabi recorded the highest yield and found suitable to the local agro-climatic conditions. The genotypes IC090132, DBT/OR-37, IC090785, IC285140, were found to be elite for different characters.

Among the characters studied, high PCV and GCV were observed for characters like plant spread, per cent fruit set of pseudo short styled flowers, number of flowers per inflorescence, number of fruits per cluster, number of fruits per plant, fruit length, fruit diameter, fruit weight, fruit yield per plant and fruit yield per hectare indicating high variability available in the germplasm for these characters for further improvement.

High heritability coupled with high genetic advance as per cent of mean was observed for characters like plant height, plant spread, number of primary branches per plant, number of
secondary branches per plant, number of flowers per inflorescence, number of fruits per cluster, number of fruits per plant, fruit length, fruit diameter, fruit weight, fruit yield per plant and fruit yield per hectare indicated that these characters were least influenced by the environmental effects, and these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

The fruit yield per plant had significant positive correlation with traits like number of flowers per inflorescence, number of fruits per cluster, number of fruits per plant, total number of harvests, yield per hectare, per cent fruit set of long, medium, short and pseudo short styled flowers, fruit length and crop duration signifying the importance of these traits in selection for yield and can be identified as yield attributing characters for the genetic improvement of yield in brinjal.

Yield per hectare, total number of harvests and days to first picking exerted a high positive direct effect on fruit yield per plant. The high direct effect of these traits appeared to be the main factor for their strong association with fruit yield per plant.

$D^2$ analysis based on Mahalanobis $D^2$ statistics grouped 44 genotypes of brinjal into seven clusters. Maximum inter cluster distance was observed between clusters III and VII whereas the intra cluster distance was maximum in cluster IV. Selection of parents from clusters III and VII for hybridization programme would help in achieving novel recombinants.

Maximum contribution towards genetic divergence by the characters viz., fruit yield per plant, number of fruits per cluster, yield per hectare and number of flowers per inflorescence suggested that selection of one or two elite genotypes from such divergent clusters based on the above characters and crossing would result in more heterosis and superior hybrids.

98) “Studies on the effect of boron and iron on vegetative growth, flowering, corm and cormel production in gladiolus (Gladiolus grandiflorus L.) cultivars” - Vijay Ilapogu.

**ABSTRACT**

The present experiment entitled “Studies on the effect of boron and iron on vegetative growth, flowering, corm and cormel production in gladiolus (Gladiolus grandiflorus L.) cultivars” were carried out during 2011-2012 at Horticultural College & Research institute, Dr. Y.S.R. Horticulture University, Venkataramannagudem, West Godavari district.

The present experiment was designed to study the effect of boron and iron on vegetative growth, flowering, corm and cormel production in three gladiolus cultivars with 15 treatments and 3 replications in a Factorial Randomized block design.

Among the vegetative parameters, the treatment 1.5 per cent iron has significantly increased plant height, number of leaves, leaf length, leaf width and leaf area at 60 and 80 DAP except for 40 DAP as spraying was undertaken at 45 days after planting with highest values in cultivar White Prosperity followed by the cvs. American beauty and Darshan.
Among the floral parameters, the treatment 1.5 per cent iron recorded more number of days (82.27) to first floret appearance and 50 per cent flowering (97.01) over other treatments. Whereas, control recorded minimum number of days to first floret appearance and 50 per cent flowering. Similarly, the treatment 1.5 per cent iron recorded more number of spikes (1.55), spike length (80.64 cm), number of florets per spike (12.16) and days to first harvest (90.23), While the interaction of 1.5 per cent iron with cultivar White Prosperity recorded maximum spike length (96.53 cm) and maximum number of florets (14.03).

The treatment 1.5 per cent iron recorded maximum values for number of corms produced (1.62), corm size (5.72 cm), corm weight (53.57 g), while iron 1 per cent recorded maximum number of cormels (28.86). In case of cultivars American beauty recorded maximum values for number of corms, corm size, corm weight, while minimum values were observed in cultivar Darshan. The maximum propagation coefficient was observed with 1.5 per cent iron (135.61) followed by 1 per cent iron. Cultivar Darshan recorded highest propagation coefficient (133.77) followed by cv. American beauty (123.71), while lowest propagation coefficient was recorded with cultivar White Prosperity(109.82).


ABSTRACT

The present experiment entitled “Evaluation of vegetable cowpea (Vigna unguiculata L. Walp) varieties for high yield in coastal Andhra Pradesh” was carried out during 2011 at Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavri district.

Nine cowpea varieties viz. Arka Garima, Arka Suman, Bhagya Lakshmi, Vellayani Local, Khashi Khanchan, Baramasi, Gomthi, Pusa Komal and local check were evaluated in Randomized block design and replicated thrice. Data was collected on plant height, number of leaves per plant, number of primary branches per plant, dry matter accumulation per plant, number of days to first flowering, number of days to 50 per cent flowering, days to first picking, crop duration, pods per plant, pod length, pod girth, mean pod weight, number of seeds per pod, test weight and pod yield per plant. Data collected was subjected to analysis of variance to test significant difference among the varieties and to estimate variance components and other genetic parameters like genetic variability, heritability, genetic advance, correlation coefficients and path analysis.

Among the varieties evaluated Vellayani Local recorded the highest plant height (161.59 cm), primary branches (9.55), leaves (173.66), dry matter accumulation (90.33 g), crop duration (95.54 days), pod length (46.70 cm), pod girth (3.51 cm), mean pod weight (28.77 g), seeds per pod (21), test weight (169.46 g) and pod yield per plant
(556.04 g) whereas it took the lowest number of days to first flowering (34.3 days), 50 per cent flowering (39.9 days) and first picking (42.9 days). Vellayani Local was followed by Baramasi for days to first flowering (35.1 days), Khashi Khanchan for 50 per cent flowering, pod girth (3.30 cm), mean pod weight (32.83 g) and test weight (148.80 g) and Arka Garima for days to first picking (45.7 days) and pod girth (3.30 cm). Gomathi recorded the highest number of pods per plant (25) followed by Vellayani Local (19.46). Bhagya Lakshmi recorded the lowest growth and yield parameters except for mean pod weight (8.18 g) and test weight (129.20 g) which were lowest in Pusa Komal ie., 6.69 g and 113.23 g respectively.

Vellayani Local was followed by Gomthi for all the growth attributes ie., plant height (145.50 cm), primary branches (8.48), leaves (141.66) and dry matter accumulation (72.38 g) and pod yield per plant (400.56 g).

In the present study, high phenotypic coefficient of variation and genotypic coefficient of variation were observed for plant height, primary branches, leaves, dry matter accumulation, pod length, pods per plant, mean pod weight and pod yield per plant. All the characters under study exhibited highest heritability. Genetic advance as percentage of mean was high in all the characters except for days to first flowering, 50 per cent flowering, first picking and crop duration.

At genotypic level, pod yield per plant had high positive correlation with seeds per pod, primary branches, number of leaves, plant height, dry matter, crop duration, pod length, pod girth, pod weight and test weight. The path analysis showed that pod length, mean pod weight, days to first picking, plant height, dry matter accumulation and days to first flowering had direct positive effect on pod yield per plant.

100) “Studies on the effect of different post harvest chemicals on shelf life and quality of banana (Musa paradisica L.) cv. Grand Naine under ambient and refrigerated conditions” – Uma Devi .S

ABSTRACT

The present investigation entitled "Studies on the effect of different post harvest chemicals on shelf life and quality of banana (Musa paradisica L.) cv. Grand Naine under ambient and refrigerated conditions" was carried out during 2011-2012 at Horticultural Research Station, Kovvur, West Godavari district of Andhra Pradesh.

Experiment was carried out to know the effect of different post harvest chemicals on physico - chemical parameters and shelf life of banana fruits at ambient and refrigerated storage conditions. The treatments are T₁ (Sodium benzoate 500 ppm), T₂ (Sodium benzoate 500 ppm kept in polythene cover), T₃ (Ascorbic acid 1000 ppm),
T_4 (Ascorbic acid 1000 ppm kept in polythene cover), T_5 (GA_3 150 ppm), T_6 (GA_3 150 ppm kept in polythene cover), T_7 (KMnO_4 1%) and T_8 (Control).

A set of two experiments were conducted in Completely Randomized Design with factorial concept and the treatments were replicated three times. Physico-chemical characters were recorded at 3 days interval at ambient condition and at 5 days interval at low temperature storage.

It was observed that the physiological loss in weight, colour index, spoilage rates, pulp to peel ratio increased while the fruit firmness, peel thickness decreased irrespective of the treatments with the advancement of storage period. Total soluble solids, reducing, non-reducing, total sugars and acidity increased initially and then decreased towards the end of the shelf life whereas ascorbic acid decreased towards the end of the storage period.

Under ambient condition, fruits treated with GA_3 (150 ppm) kept in polythene cover (T_6) recorded lower values for physiological loss in weight (6.58%), colour development (3.08), spoilage (16.39%), pulp to peel ratio (2.01) and Total soluble solids (15.43 \(^0\)B). Similarly, the above treatment recorded higher values for firmness (3.19 kg/cm\(^2\)), peel thickness (2.73 mm), acidity (0.34%), reducing sugars (8.56%), non-reducing sugars (4.46%), total sugars (13.02%) and ascorbic acid (11.25 mg/100gm) and thereby recorded more shelf life (18 days) than rest of the treatments. Organoleptic scoring for appearance, taste and over all acceptability was also higher when fruits were sprayed with GA_3 (150 ppm) kept in polythene cover. Next to T_6 (GA_3 150 ppm kept in polythene cover), KMnO_4 1% (T_7) also recorded higher shelf life of 16.93 days.

At refrigerated storage, lower values for physiological loss in weight (5.19%), colour development (2.64), spoilage (15.93%), pulp to peel ratio (1.69) and Total soluble solids (13.98 \(^0\)B) and higher values for firmness (3.85 kg/cm\(^2\)), peel thickness (2.97mm), acidity (0.35%), reducing sugars (8.03%), non-reducing sugars (4.40%), total sugars (12.43%), ascorbic acid (11.42 mg/100gm) and organoleptic score were observed with GA_3 150 ppm kept in polythene cover and thereby recorded higher shelf life of 40.42 days over other treatments. Next to T_6 (GA_3 150 ppm kept in polythene cover), SB 500 ppm kept in polythene cover (T_2) recorded higher shelf life of 16 days over control.
Under both the conditions, fruits treated with GA$_3$ (150 ppm) kept in polythene cover recorded higher shelf life and less spoilage of fruits as compared to other treatments.


**ABSTRACT**

An investigation was conducted on post harvest drying and storage of tomato (*Lycopersicon esculentum*) seeds using desiccant (zeolite) beads and their effects on seed quality was carried out during August 2011 to April 2012 at the Department of Seed Science and Technology, ANGRAU, Rajendranagar, Hyderabad. The treatments included seed drying and storage using zeolite beads and silica gel under ambient conditions. The experiment was laid out in completely randomized design with five treatments and three replications.

The study revealed that zeolite beads at 1:1 and 0.5:1 bead seed ratio dried the seeds to the lowest moisture content of 4.4 and 7% respectively after 96 hours of seed drying which was followed by silica gel at 1:1 and 0.5:1 silica gel to seed ratio which lowered seed moisture to 7.2% and 8.4% after 96 hrs of seed drying, respectively. Germination percent and seedling length was not significantly affected by the extent and speed of seed drying after 96 hrs with desiccants zeolite beads and silica gel and remained the same as that of the control.

Studies made on the effect of zeolite beads (desiccant beads) on seed storability and seed quality revealed that among all treatments zeolite beads found to be superior in lowering seed moisture content to (2.1%) after 8 months of storage period, followed by silica gel (5.2%) at the end of storage period. Whereas, seeds stored in cloth bag (control) the seed moisture content per cent fluctuated with environmental conditions i.e. temperature and atmospheric relative humidity and at the end of storage recorded 9.6% seed moisture content. Seed stored with silica gel recorded the highest germination percent (89) which was on par with zeolite beads (88) at the end of storage period. The highest seedling root length of 13.4 and 13.3 cm was recorded by silica gel and zeolite beads respectively at the end of storage period. Zeolite beads recorded higher shoot length of 6.3 cm which was on par with silica gel (6.2 cm) followed by poly pouch (5.9 cm) and airtight container (5.9 cm) after 8 months of seed storage. Lower electrical conductivity of seed leachate of 0.289 dSm$^{-1}$ was observed in seeds stored with silica gel, followed by zeolite beads (0.293 dSm$^{-1}$) at the end of storage period. Higher seedling dry weight of 83 mg was observed in seeds stored with silica gel which was on par with zeolite beads (81 mg), followed by poly pouch (80 mg) and airtight container (79 mg) at the end of storage period. Silica gel recorded higher vigour indices I and II of 1747 and 7387 respectively followed by zeolite beads 1728 and 7158 respectively, at the end of storage. Higher field emergence of 85% and 84% was observed in seeds stored with silica gel and zeolite beads respectively, at 8$^{th}$ month, followed by poly pouch (79%) and airtight container (77%). No seed borne pathogen infection was observed in seed stored with zeolite beads or silica gel, higher seed infection of 5.33%, 4% and 3.33% was recorded in seeds stored in cloth bag, airtight container and poly pouch, respectively.
The maximum benefit cost ratio of (150:1) and (107:1) was recorded in seeds stored with desiccants zeolite beads and silica gel respectively at the end of storage period compared to control.

102) "Genetic Divergence Studies In Indigenous French Bean (Phaseolus vulgaris L.) Germplasm” P. Arun Kumar.

ABSTRACT

A field experiment was conducted to estimate the genetic variability and genetic divergence in French bean and to carry out yield component analysis through correlation and path analysis. Forty one local landraces along with three checks were sown in a randomized block design with three replications, during rabi 2011-12 at the NBPGR Regional Station, Rajendranagar, Hyderabad. The objective of the experiment was to identify divergent genotypes to be used as donor parents in hybridization programmes.

The analysis of variance revealed significant differences among genotypes indicating presence of sufficient amount of variability in all the characters studied. Wide range of variability was observed for marketable pod yield per plant, pod weight and number of pods per plant indicating the scope for selection of suitable breeding material for further improvement. On the basis of mean performance of the genotypes among traits studied, AUV-315, SRS-13456, SRS-13451 and SRS-13443 were identified as promising lines for further crop improvement.

Genetic advance as percent of mean, Genotypic and Phenotypic coefficient of variation values was on par for most of the characters which indicates the influence of environment on the trait (s) was very negligible. The values observed were not confounding with the environment. It is a true reflection of homeostasis or buffer reaction of the gene. Thus, the true reflection of the trait is exhibited. A true agreement with GCV and PCV values for the eighteen characters was noticed, indicating additive genetic variance governing the high heritability coupled with high genetic advance as percent of mean. Thus, a breeder can employ simple selection which will be rewarding to improve all the characters except for days to last pod harvest wherein high heritability coupled with moderate GA as per cent of mean indicates additive and non additive action controlling the trait.

By Mahalanobi`s $D^2$ statistic, it could be inferred that 100 seed weight, followed by pod weight, protein content, days to first flowering, length of inflorescence, number of inflorescences per plant, number of pods per inflorescence, days to last pod harvest, plant height, marketable pod yield per plant, days to first pod harvest, pod length, number of flowers per inflorescence, number of pods per inflorescence and number of seeds per pod contributed maximum towards genetic divergence. The $D^2$ analysis partitioned forty four genotypes into seven clusters. Maximum divergence was observed between cluster III and VI, while minimum was between cluster VI and I. The maximum intracluster distance was shown by cluster V. The clusters showing high genetic divergence could be effectively utilized in heterosis breeding programme.
From correlation studies it was observed that marketable pod yield per plant has exhibited highly significant positive association with length of inflorescence followed by number of inflorescences per plant, number of flowers per inflorescence, number of pods per inflorescence, pod length, pod weight, number of pods per plant and number of seeds per pod.

Path analysis revealed that maximum positive direct effect on marketable pod yield per plant was exhibited through number of pods per plant followed by pod weight and days to 50 percent flowering. Pod weight, pod width and number of seeds per pod exhibited high, moderate and low positive indirect effect on marketable pod yield per plant.

Thus, French bean genotypes exhibited high variability for all the qualitative traits viz., plant, flower, pod and seed characters.

Therefore, it is emphasized to lay attention on the traits viz., number of pods per plant, pod weight, days to last pod harvest, pod length and protein content in crop improvement programme of French bean in future.

103) “Effect of different priming methods on seed quality, biochemical changes on seed storability of china aster (Callistephus chinensis L. Nees)”- B. Vimala.

ABSTRACT

A laboratory experiment, “Effect of different priming methods on seed quality, biochemical changes on seed storability of china aster (Callistephus chinensis L. Nees)” on ‘kamini’ variety was conducted at College of Horticulture, Dr.Y.S.R. Horticulture University, Rajendranagar, Hyderabad during the year 2011-12. The experiment was laid in factorial completely randomised block design comprising two factors viz., age of the seed and then other as priming method. Entire treatments were replicated four times.

The experiment consisted of four treatments viz., Hydro priming (T₁), Osmo priming(T₂), Halo priming(T₃), Unprimed as control (T₄), as one factor and two different ages of the seed viz., one year old seed (S₁) and Half year old seed (S₂) as another factor, which was replicated four times in completely randomized design with factorial concept. Seed samples were primed and kept in polyethythelene bag and stored for six months at ambient condition.

The treated seeds were used to observe different physiological and biochemical changes in each month upto a period of six months. The samples were drawn at monthly intervals for assessing the seed quality parameters viz., germination percentage, speed of germination, root length, shoot length, seedling vigour index, seedling dry weight, field emergence and electrical conductivity, lipid peroxidase activity and dehydrogenase activity.
The results emanated from the experiment revealed that, amongst the two different ages of the seed, six months old seed recorded maximum germination percentage, field emergence, speed of germination, seedling length, seedling dry weight and seedling vigor index and least was observed in one year old seed. Amongst the priming treatments, priming of seed with KNO$_3$ @ 0.5% resulted in best performance of the seed regarding all the physiological and biochemical parameters followed by hydro priming. Unprimed seed (control) failed to exert any significant influence on the quality parameters. Storage of the treated seeds up to six months resulted in a gradual decrease in performance of the seed. However, storage of the six months old KNO$_3$ treated seed up to six months was found to be good compared to one year old seed regarding all the quality parameters.

As a whole, treating of the six months old seed with KNO$_3$ @ 0.5% gave good results compared to all other priming treatments as well as control in all respects.

104) “Preliminary characterization and evaluation of exotic lines of Tomato (Solanum lycopersicum L.)”- B. Rajasekhar Reddy

ABSTRACT

A set of 56 exotic collections of tomato (Solanum lycopersicum L.) along with 3 checks viz., Arka Vikas, Marutham and Punjab Chhauhara were evaluated in an augmented block design with eight blocks at National Bureau of Plant Genetic Resources Regional Station, Hyderabad during rabi, 2011-12 for the purpose of studying genetic diversity, variability, heritability, genetic advance and character association for eighteen quantitative traits pertaining to growth, earliness, yield and quality.

The analysis of variance revealed significant difference for all the eighteen quantitative and fruit quality attributes. On the basis of the mean performance the genotypes EC677102, EC677047, EC671596, EC676783 were superior for earliness, EC676789, EC676799, EC676725, EC677076 and EC677072 were superior for fruit yield and the genotypes EC677076, EC676791, EC677130, EC581017 and EC581018 were superior for quality, which can be utilized in various breeding programmes for the development of either pureline variety or $F_1$ hybrids.

Multivariate analysis following Mahalanobis $D^2$ statistics revealed distinct clustering pattern and considerable genetic diversity within and between clusters and were grouped into seven clusters. The characters fruit weight, number of fruits per plant and plant height were found to be the potent factors in differentiating the genotypes under study.

From the coefficient of variation it is evident that the estimates of PCV were higher than the corresponding GCV for all the eighteen quantitative attributes indicating the greater influence of environment on the expression of these genotypes. The estimates of genotypic and phenotypic coefficient of variation were high for plant height, number of primary branches per plant, number of flowers per cluster, number of fruits per cluster, fruit length, fruit weight, fruit yield and ascorbic acid indicating the existence of high degree in the material under study offering ample scope for selection.

The attributes plant height, number of primary branches per plant, number of flowers per cluster, number of fruits per cluster, fruit length, fruit weight and acidity had high heritability (>60%) accompanied with high genetic advance over percent mean (>20%) indicating that
most likely the heritability is due to additive gene action and the chances of fixing by selection is easy to improve these traits.

Simple correlation coefficient analysis revealed significantly positive association of plant height, number of primary branches per plant, number of flowers per cluster, fruit length and width with fruit yield, while no association of ascorbic acid, acidity and TSS with shelf life.

Of the five quantitative traits which had positively significant association with fruit yield only number of primary branches per plant and number of flowers per cluster had positively high direct effect indicating that direct selection for these characters will be effective. For plant height, fruit length and fruit width whose direct effect is negligible to low but had significantly positive correlation with fruit yield, indirect selection will be effective.

On the whole, there was magnificent diversity and variability for all the eighteen characters under study. The characters plant height, number of primary branches per plant, number of flowers per cluster, fruit length and fruit width were identified as yield components in tomato. Considering these components as selection indices, the genotypes EC676789 and EC676799 were horticulturally superior with respect to indeterminate growth and fruit yield and the genotypes EC677076 and EC676725 were determinate, horticulturally superior for both fruit yield and fruit quality attributes.


ABSTRACT

A field experiment, “Integrated weed management in Okra (Abelmoschus esculentus (L.) Moench) Cv. Arka Anamika” was conducted at Model Orchard, College of Horticulture, Dr.Y.S.R. Horticultural University, Rajendranagar, Hyderabad during the year 2011-12. The experiment was laid out in Randomized Block Design with twelve treatments and replicated thrice.

The treatments consists of Pendimethalin C.S as pre emergence @0.6 kg a.i ha$^{-1}$ (T$_1$), Alachlor as pre emergence @1.0 kg a.i ha$^{-1}$ (T$_2$), Oxyfluorfen as pre emergence @0.15 kg a.i ha$^{-1}$ (T$_3$), Pendimethalin C.S as pre emergence @0.6 kg a.i ha$^{-1}$ followed by Quizalofop ethyl @ 50 g a.i ha$^{-1}$ as post emergence at 2-3 leaf stage of weed (T$_4$), Pendimethalin C.S as pre emergence @0.6 kg a.i ha$^{-1}$+ one hand weeding at 30 DAS (T$_5$), Alachlor as pre emergence @1.0 kg a.i ha$^{-1}$ followed by Quizalofop ethyl @50 g a.i ha$^{-1}$ as post emergence at 2-3 leaf stage of weed (T$_6$), Alachlor as pre emergence @1.0 kg a.i ha$^{-1}$ + one hand weeding at 30 DAS (T$_7$), Oxyfluorfen as pre emergence @0.15 kg a.i ha$^{-1}$ followed by Quizalofop ethyl @50 g a.i ha$^{-1}$ as post emergence at 2-3 leaf stage of weed (T$_8$), Oxyfluorfen as pre emergence @0.15 kg a.i ha$^{-1}$+ one hand weeding at 30 DAS (T$_9$), Quizalofop ethyl @50 g a.i ha$^{-1}$ as post emergence at 2-3 leaf stage of weed (T$_{10}$), Farmers practice (2 HWs at 20 and 40 DAS) (T$_{11}$), Weedy check (Control) (T$_{12}$).

The results of the experiment revealed that among the different weed management practices, application of Oxyfluorfen as pre emergence @0.15 kg a.i ha$^{-1}$+ one hand weeding at 30 DAS recorded significantly the highest Weed Control Efficiency (WCE).
The lowest Weed Index (WI) (3.76%) was recorded in farmers practice of hand weeding at 20 and 40 days after sowing.

Among the different weed management practices, Oxyfluorfen as pre emergence @0.15 kg a.i ha\(^{-1}\) + one hand weeding at 30 DAS produced significantly the tallest plants, higher crop dry weight, high leaf area index, high pod yield per plant (127.16 g) and higher total pod yield (13279 kg ha\(^{-1}\)).

The nutrient (N, P and K) uptake by crop was significantly the highest ( 78.53, 23.27 and 66.64 kg ha\(^{-1}\) N, P and K respectively) with application of Oxyfluorfen as pre emergence @0.15 kg a.i ha\(^{-1}\) + one hand weeding at 30 DAS. The highest uptake of nutrients by weeds (63.81, 17.73 and 45.24 kg ha\(^{-1}\) N, P and K respectively) recorded in weedy check.

Among the different weed management practices the gross returns was maximum (Rs.146069 ha\(^{-1}\)), net returns (Rs.93,964 ha\(^{-1}\)) and B:C ratio (1.80) were also significantly higher with the application of Oxyfluorfen as pre emergence @0.15 kg a.i ha\(^{-1}\) + one hand weeding at 30 DAS.


**ABSTRACT**

A set of three experiments were conducted at post harvest technology laboratory, college of Horticulture, Rajendranagar during the year 2009-10 to study the influence of storage period and packing material on quality of pomegranate fruit and arils (Punica granatum L.) cv. Bhagwa. The fruit and arils stored under 4±1\(^\circ\)C temperature.

As the storage period increased physiological loss in weight, external appearance, spoilage, firmness, sugars, ascorbic acid anthocyanins and the total soluble solids of fruits & arils decreased.

Among the different treatments, the pomegranate arils packed in polymeric bags resulted in increased shelf life of 6 days over the control at 4±1\(^\circ\)C temperature. Pomegranate arils packed in 100gauge polymeric bags, the external appearance, shelf life, acidity, sugars, ascorbic acid and anthocyanins were found to be higher when compare to control. In case of storage process arils the TSS initially increased up to 4 days and thereafter declined. The overall acceptability of stored arils decreased with increase in storage period.

As the storage period increased the arils extracte from stored pomegranate fruits had shown decreased physiological loss in weight, shelf life, external appearance, acidity, sugars, ascorbic acid and anthocyanins. The fresh arils recorded higher physical and chemical parameters.

ABSTRACT

A set of six experiments on the effect of MAP (Polypropylene bags with different number of pores), hot water treatments (45°C, 50°C and 55°C for 5, 10, 15 and 20 minutes) and combination of MAP (two best treatments of MAP) and hot water treatments (two best treatments of hot water experiment) on shelf life of custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar stored at ambient temperature, was conducted at Fruit Research Station, Sangareddy, Dr YSRHU, A.P. The MAP and hot water experiments were laid out in completely randomized design with factorial concept with three replications and the combination experiments have three replications in MAP and five replications in hot water experiment. Various physical parameters like PLW (%), firmness (kg cm⁻²), spoilage (%), ripening (%) and biochemical parameters like TSS ('Brix), acidity (%), brix-acid ratio, sugars (%) and ascorbic acid (mg/100 g) were estimated at an interval of 2 days during storage in all the experiments.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were packed in polypropylene bags with different number of pores and stored at ambient temperature. Cultivar Balanagar, in polypropylene bags with 20 pores recorded significantly lower PLW, highest firmness, minimum ripening, minimum spoilage, superior appearance and overall acceptability than control fruits. Biochemical parameters like TSS and total sugars were significantly lower in fruits packed in polypropylene bags with 20 pores than control. Significantly highest acidity was recorded in fruits packed in polypropylene bags with 50 pores. Significantly lowest non-reducing sugars were recorded in fruits packed in polypropylene bags with 30 pores. Significantly highest ascorbic acid was recorded in fruits packed in polypropylene bags with 30 pores. The control fruits recorded a shelf life of 4.63 days. In cv. Balanagar, fruits packed in polypropylene bags with 20 pores recorded significantly lower spoilage and correspondingly increased the shelf life up to 7.99 days. In hybrid Atemoya X Balanagar, polypropylene bags without pores followed by fruits packed in polypropylene bags with 10 pores was recorded significantly lower PLW, highest firmness, minimum ripening. Significantly lowest spoilage and superior appearance and overall acceptability was recorded in fruits packed in polypropylene bags with 10 pores. Biochemical parameters like TSS, brix-acid ratio and total sugars were significantly lower in fruits packed in polypropylene bags with, without pores, 50 pores and 30 pores respectively than control. Significantly highest acidity was recorded in fruits packed in polypropylene bags with 10 pores. Significantly lowest non-reducing sugars and highest ascorbic acid were recorded in control and fruits packed in polypropylene bags with 30 pores respectively. The control fruits recorded a shelf life of 3.34 days. In hybrid Atemoya X Balanagar, fruits packed in polypropylene bags with 10 pores recorded significantly lower spoilage and correspondingly increased the shelf life up to 6.00 days.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were treated with hot water and stored at ambient temperature. In Balanagar, fruits treated with hot water at 50°C for 15 minutes recorded significantly lowest PLW, highest firmness, minimum ripening, minimum spoilage, superior appearance and overall acceptability than control. Biochemical parameters like TSS, brix-acid ratio and total sugars were recorded lowest and ascorbic acid recorded highest in fruits treated with hot water at 50°C for 5 minutes, 45°C for 15 minutes, 55°C for 15 minutes and 50°C for 20 minutes. The hot water treated fruits recorded significantly highest acidity and the lowest non-reducing sugars than control. The control fruits recorded a shelf life of 4.63 days. In cv. Balanagar, fruits treated with hot water at 50°C for 15 minutes recorded significantly lower spoilage and correspondingly increased the shelf life up to 7.46 days. In hybrid Atemoya X Balanagar fruits treated with hot water at 55°C for 5 minutes
recorded significantly lowest PLW, highest firmness, minimum ripening, minimum spoilage, superior appearance and overall acceptability than control. Biochemical parameters like TSS, brix-acid ratio and total sugars were recorded lowest in fruits treated with 55\(^0\)C for 20 minutes, 50\(^0\)C for 5 minutes and 55\(^0\)C for 10 minutes respectively. The hot water treated fruits recorded significantly the highest acidity and the lowest non-reducing sugars. The control fruits recorded a shelf life of 3.34 days. In hybrid Atemoya X Balanagar, fruits treated with hot water at 55\(^0\)C for 5 minutes recorded significantly lower spoilage and correspondingly increased the shelf life up to 4.81 days.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were treated with hot water (two best treatments from 2\(^{\text{nd}}\) experiment) and packed Polypropylene bags (two best treatments from 1\(^{\text{st}}\) experiment) and stored at ambient temperature. In Balanagar, fruits treated at 50\(^0\)C for 20 minutes and then packing in polypropylene bags with 20 pores recorded significantly lowest PLW, highest firmness, minimum ripening, minimum spoilage, superior for appearance and overall acceptability. Biochemical parameters like TSS, brix-acid ratio and reducing sugars were observed to be the lowest and highest ascorbic acid content in fruits treated at 50\(^0\)C for 15 minutes and then packed in polypropylene bags with 20 pores, 50\(^0\)C for 15 minutes and then packed in polypropylene bags with 10 pores, 50\(^0\)C for 20 minutes and then packed in polypropylene bags with 10 pores, 50\(^0\)C for 15 minutes and then packed in polypropylene bags with 10 pores. Significantly highest acidity were recorded in treated fruits 50\(^0\)C for 20 minutes and then packed in polypropylene bags with 10 pores and 20 pores. The control fruits recorded a shelf life of 4.63 days. In cv. Balanagar, fruits treated with hot water at 50\(^0\)C for 20 minutes then packed in polypropylene bags with 20 pores recorded significantly lower spoilage and correspondingly increased the shelf life up to 8.00 days. In hybrid Atemoya X Balanagar, fruits treated with 55\(^0\)C for 10 minutes and then packing in polypropylene bags with 20 pores recorded significantly lowest PLW, highest firmness, minimum ripening, minimum spoilage, superior for appearance and overall acceptability. Biochemical parameters like TSS were observed to be the lowest and highest acidity at 55\(^0\)C for 5 minutes and then packed in polypropylene bags with 30 pores. Significantly lowest sugars and highest ascorbic acid content were recorded in treated fruits treated at 55\(^0\)C for 5 minutes and then packed in polypropylene bags with 20 pores. The control fruits recorded a shelf life of 3.34 days. In hybrid Atemoya X Balanagar, fruits treated with hot water at 55\(^0\)C for 10 minutes then packed in polypropylene bags with 30 pores recorded significantly lower spoilage and correspondingly increased the shelf life up to 5.04 days.

In custard apple cv. Balanagar, modified atmospheric packaging, hot water treatments and combination of both enhanced the shelf life of 3.36, 2.83 and 3.37 days over the control.

In custard apple hybrid Atemoya X Balanagar, modified atmospheric packaging, hot water treatments and combination of both enhanced the shelf life of 2.60, 1.41 and 1.64 days over the control.


ABSTRACT

Investigation was carried out at Grape Research Station, Dr.Y.S.R Horticultural University, Rajendranagar, Hyderabad during October 2011 – December 2011 to find out the
“The effect of cytokinins and silver nitrate on success of graft union in Thompson Seedless grape (*Vitis vinifera* L.).”

A set of two experiments were conducted in Completely Randomized Design one in open conditions and another in polyhouse conditions with same treatments for cuttings grafted on Dogridge and Salt Creek. The treatments included three different concentrations of BAP (150 ppm, 250 ppm and 350 ppm), kinetin (150 ppm, 250 ppm and 350 ppm), silver nitrate (50 ppm, 100 ppm and 150 ppm) and control, IBA 2000 ppm was commonly treated for all the basal end of the rootstock cuttings. The treated cuttings were grafted and analyzed for various growth parameters viz., number of days required for bud sprouting of scion, percentage survival of grafts at 30, 40, 50 and 60 days interval, scion length after 30, 40, 50 and 60 days (cm), number of leaves after 30, 40, 50 and 60 days(cm), number of roots after 60 days, mean root length after 60 days (cm), maximum root length after 60 days (cm), fresh weight of roots after 60 days (gm/graft), dry weight of roots after 60 days (gm/graft), fresh weight of shoot after 60 days (gm/graft), dry weight of shoot after 60 days (gm/graft), scion/stock ratio, callus degree and rooting degree.

All the growth parameters of grafts grown under polyhouse condition were better when compared to open condition while rooting parameters like number of roots, mean root length, maximum root length, fresh weight of roots after 60 days, dry weight of roots after 60 days and rooting degree were higher in grafts kept under open conditions.

Cuttings of Thompson seedless grafted on Dogridge rootstock recorded better results when compared to Salt Creek rootstock in both the growing conditions.

Among the various treatments cuttings treated with kinetin 250 ppm followed by BAP 250 ppm recorded beneficial effect on the early union of grafts and subsequent improvement in growth parameters. Though AgNO₃ has antisenescence effect which can help in delaying abscission by inhibiting ethylene synthesis it had little effect on graft success when compared to kinetin and BAP on both the rootstocks.

Cuttings of Thompson seedless grafted on Dogridge rootstock recorded better results when compared to Salt Creek rootstock in both the growing conditions.


**ABSTRACT**

The present experiment entitled “GENETIC VARIABILITY AND CORRELATION STUDIES IN GLADIOLUS (*Gladiolus grandiflorus* L.)” carried out during the rabi, 2011-2012 at Horticultural Research Station, Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district. The studies were carried out in Randomized Block Design using twenty cultivars to study the genetic variability, heritability, genetic advance and correlations among quantitative characters.

In the present study observations recorded for the following characters viz., plant height at flowering stage and spike fully opened, number of leaves at flowering stage, number of days taken to 50 per cent flowering, number of days taken for basal floret to open, number of spikes per plant, spike length at harvest, number of florets per spike, floret colour, floret length, floret
diameter, number of corms produced per mother corm, corm diameter, corm weight and cormel
diameter.

There were highly significant differences for all the characters studied. Wide range of
variability was observed for the characters like number of leaves at flowering stage, number of
spikes per plant, number of corms produced per mother corm and corm weight. These
characters could be considered as useful selection criteria for differentiating the gladiolus
cultivars.

Heritability and genetic advance as per cent of mean were high for plant height at
flowering stage and spike fully opened, number of leaves at flowering stage, number of spikes
per plant, spike length at harvest, number of florets per spike, floret diameter, corm diameter
and corm weight. These characters offer scope for their improvement by applying selection
pressure in breeding programme.

The correlation studies revealed that yield parameters like spike length at harvest
exhibited significant positive correlation with number of florets per spike and floret size.
Number of spikes per plant shown significant positive correlation with number of corms
produced per mother corm and improvement of these traits will directly influence the yield of
spikes.

110) “Studies On The Effect Of Plant Growth Regulators And Chemicals
On Flowering, Fruit Set And Yield Of Mango (Mangifera indica L)
cv.Baganpalli” – G.Vijaya Krishna.

ABSTRACT

A set of two experiments on the effect of plant growth regulators (paclobutrazol @
3ml.m⁻¹ canopy diameter, NAA @ 80 ppm), flower enhancing chemicals (Ca (NO₃)₂ @ 1%,
H₃PO₄ @ 0.5%, KH₂PO₄ @ 1%) in combination with fruit set improving chemicals
(spermidine @ 0.01 mM, spermine @ 0.1 mM, boron -20% @1.25gm.l⁻¹) on flowering, fruit
set and yield of mango cv. Baganpalli, was conducted at Fruit Research Station, Sangareddy,
Dr. YSRHU, A.P. In two experiments the design adopted is Randomized Block Design with
factorial concept with three replications per treatment. Various vegetative parameters like
number of new flushes (number), internodal length (cm), flowering parameters like time taken
for panicle initiation(days), days taken for 50 % flowering and 100 % flowering per cent of
flowering (%), panicle length and panicle breadth (cm), and yield parameters like number of
days taken for fruit set from panicle initiation (days), number of fruits, panicle⁻¹ (number),
number of fruits tree⁻¹, fruit weight (gm) and yield (kg tree⁻¹) were recorded.

In the first experiment mango cv. Baganpalli trees were sprayed with flower
enhancing plant growth regulators and fruit set improving chemicals alone and in
combinations. Trees applied with paclobutrazol alone significantly reduced the vegetative
growth in terms of minimum number of new flushes and internodal length compared to control
trees. Paclobutrazol alone and in combinations with fruit set improving chemical significantly
minimized the number of days taken for panicle initiation and increased the number of days
taken for 50% and 100% flowering, duration of flowering along with increase in percent of
flowering, panicle length and breadth when compare to control trees. Significantly the highest
fruits.panicle⁻¹, fruit.tree⁻¹ and yield was recorded in paclobutrazol (42.17 % over control)
alone applied trees compare to control. Boron could able to significantly increase the fruit.panicle\(^{-1}\) and final retention of fruits and increased the fruit weight reflecting in the overall increase in yield by 37 percent. Among the combination, maximum increase in yield over control was recorded in paclobutrazol application along with spermidine (63.11 %), NAA + spermidine (57.59 %), NAA + boron (60.03 %). However, based on benefit cost ratio spraying of NAA + Boron has give maximum benefit cost ratio of 3.06. Among the fruit set improving chemical boron either alone or in combination with NAA has recorded highest improvement in the yield.

In the second experiment mango cv. Banganpalli trees were sprayed with flower enhancing chemicals in combination with fruit set improving chemicals. Ca (NO\(_3\))\(_2\) applied trees has reduced significantly the number of new flushes and H\(_3\)PO\(_4\) has significantly reduced the intermodal length. KH\(_2\)PO\(_4\) and H\(_3\)PO\(_4\) alone or in combinations with fruit set improving chemical significantly minimized the number of days taken for panicle initiation and increased the number of days taken for 50% and 100% flowering, duration of flowering along with increase in percent of flowering, panicle length and breadth when compare to control trees. Significantly the highest fruits.panicle\(^{-1}\), fruit. tree\(^{-1}\) and yield was recorded in Ca(NO\(_3\))\(_2\) applied trees and spermidine (48.72 % over control) applied trees alone compare to control. Spermidine alone could able to significantly increase the fruit.panicle\(^{-1}\) and final retention of fruits and increased the fruit weight reflecting in the overall increase in yield by 48.72 %. Among the combination, maximum increase in yield over control was recorded in Ca (NO\(_3\))\(_2\) + spermidine (87.27 %), H\(_3\)PO\(_4\) + spermine (76.09 %), KH\(_2\)PO\(_4\) + Spermine (74.51 %). However, based on benefit cost ratio spraying of Ca (NO\(_3\))\(_2\) + spermidine has give maximum benefit cost ratio of 3.35.


ABSTRACT

The present investigation entitled “STUDIES ON THE EFFECT OF PLANTING DENSITY AND NUTRIENT MANAGEMENT IN AMARANTHUS (Amaranthus tricolor L.) cv. ARKA SUGUNA” was carried out in late kharif, 2011 at Horticulture College and Research Institute, Venkataramanagudem, Dr. Y. S. R. Horticultural University, West Godavari District.

The present study included 15 treatment combinations each replicated thrice in Factorial Randomized Block Design. The treatment combinations included three levels of plant densities (3,33,333 plants per ha, 1,66,666 plants per ha and 1,11,111 plants per ha) and five nutrient combinations (100% Recommended dose of fertilizers, 50% Recommended dose of fertilizers + 1% 19-19-19, 25% Recommended dose of fertilizers + 2% 19-19-19, 50% Recommended dose of fertilizers + 1% 20-20-20 and 25% Recommended dose of fertilizers + 2% 20-20-20).

The study revealed that amaranthus cv. Arka Suguna responded well to plant densities as well as nutrient combinations. Among the growth parameters plant height was favorably influenced by high density planting (D\(_1\)) and nutrient combination of 25% Recommended dose of fertilizers + 2% 20-20-20 (N\(_3\)) whereas, number of leaves per plant, leaf area, branches per
plant and dry matter production were recorded maximum with lower plant density ($D_3$) and the nutrient combination of 25% Recommended dose of fertilizers + 2% 20-20-20 ($N_5$). Among the yield and yield attributing character, leaf weight per plant and stem weight per plant showed better expression with lower plant density ($D_3$) and 25% recommended dose of fertilizers along with foliar spay of 2% 20-20-20 ($N_5$). However, the green yield per plot and hectare were found significantly superior with the high density planting ($D_1$) and 25% recommended dose of fertilizers along with foliar spay of 2% 20-20-20 ($N_5$). The quality parameters like chlorophyll content and crude protein content responded negatively to high plant density, however, maximum values were recorded with low plant density ($D$) The interaction effect of plant densities and nutrient combinations were found significant with plant height, leaf area and dry matter production per plant. Plant height, total yield per plot and per hectare and B:C ratio was recorded maximum in the treatment combination of $D_1N_5$ i.e. higher plant density with increasing level of foliar spray. However, number of leaves, leaf area, branches per plant, leaf weight per plant and stem weight per plant were found to be the highest with treatment combination of $D_3N_5$ i.e. lower plant densities with increase in the concentration of foliar spray. 3) and 25% recommended dose of fertilizers along with six foliar spays of 2% 20-20-20 ($N_5$) at one week after each havesting.

112) “Effect of different herbicides and organic mulches on weed control in spray chrysanthemum (Dendranthema grandiflora L.)”- B. Laxmi Chaitanya.

**ABSTRACT**

An experiment entitled “Effect of different herbicides and organic mulches on weed control in spray chrysanthemum (Dendranthema grandiflora L.)” was conducted during 2010-2011 in Kharif season at All India Coordinated Research Project on Floriculture, Agricultural Research Institute, Rajendranagar, Hyderabad during the year 2010-2011. There are 11 treatments, each replicated thrice in RBD.

The treatments consists of Dried leaf mulch, Paddy straw, Hand weeding at 20, 40 and 60 DAT, Unweeded control, Quizalofop ethyl as post emergence @ 50 g a.i./ha, Pendimethalin as pre-emergence @ 1 kg a.i./ha, Alachlor as pre-emergence @ 1 kg a.i./ha, Pendimethalin as pre-emergence @ 0.75 kg a.i./ha+ Quizalofop ethyl as post emergence @ 50 g a.i./ha, Alachlor as pre-emergence @ 0.75 kg a.i./ha + quizalofop ethyl as post emergence @ 50 g a.i./ha, Pendimethalin as pre-emergence @ 0.75 kg a.i./ha+ hand weeding, and Alachlor as pre-emergence @ 0.75 kg a.i./ha + hand weeding.

Hand weeding recorded vegetative parameters like maximum plant height, more number of branches per plant and maximum horizontal spread of the plant at 30, 60, 90, 120 days after transplanting.

Floral parameters like early flower initiation, maximum number of sprays per plant and early to reach full bloom (50 per cent flowering) were recorded in treatments hand weeding.

Diameter of the flower, spray length, no. of flowers per spray and weight of single flower were recorded highest in treatment hand weeding.

The weed control treatments also showed difference in duration of flowering. Among the treatments hand weeding showed extended period of flowering.
The maximum shelf life was exhibited by the treatments hand weeding. There was significant increase in no. of flowers per plant, weight of flowers per plant and weight of flowers per plot in treatment hand weeding.

At all the crop growth stages, unweeded control had significantly higher weed count and higher dry matter of weeds. In general, the weeds population and weeds dry weight were reduced with the application of herbicides and mulching materials.

Hand weeding was very effective in controlling weed density. The total dry weight of weeds differed significantly at all the stages of plant growth. However, unweeded control recorded maximum dry weight of weeds indicating higher density and luxurious growth of weeds.

Weed control efficiency was significantly varied due to weed control treatments. Hand weeding recorded the highest weed control efficiency followed by pendimethalin as pre-emergence + hand weeding. Weed index was lowest in treatment hand weeding and it was on par with pendimethalin as pre-emergence + hand weeding.

Plant nitrogen, phosphorus and potassium content were significantly varied with different weed control treatments. The treatment with hand weeding recorded highest nitrogen, phosphorus, potassium content followed by pedimethalin as pre-emergence + hand weeding.

The highest net returns and marginal returns were obtained in treatment hand weeding followed by pendimethalin as pre-emergece + hand weeding. Highest B:C was obtained in treatment pendimethalin as pre-emergece+ hand weeding.

From the results it can be summarized that among the weed control treatments pendimethalin pendimethalin as pre-emergence + hand weeding may be recommended for reducing weed population, better growth and for high yields. And also get more profits due to labour cost.


ABSTRACT

The effect of soils and different shade levels on the growth and establishment of four lawn grass species were examined in two experiments at Floricultural Research Station and College of Horticulture, Rajendranagar, Hyderabad during 2011-12.

In the experiment-I, four lawngrass species viz., Argentine bahiagrass, Koreangrass, Bermudagrass (warm season grasses) and Perennial ryegrass(cool season grass) were evaluated on three soil types viz. red soil, black soil and laterite soil in a randomized block design. In the experiment-II the effect of shade on growth and performance of four lawngrases (Argentine bahiagrass, Koreangrass, Bermudagrass and Perennial ryegrass) were studied under four levels of shade (0%,35%,50% ,75%) in split plot design.

Significant differences in morphological and physiological parameters of lawngrases were observed in different soils. The Bermudagrass exhibited maximum shoot elongation, and
ground coverage and was considered as the best species for all soil types. Argentine bahiagrass and perennial Ryegrasses relatively performed well under red and black soils. They recorded maximum stem thickness, leaf area, root length, root-shoot ratio, ground coverage and chlorophyll content in these soils. Bermuda and Koreangrasses had fine leaf texture when compared to Argentine bahia and Perennial ryegrasses. Perennial ryegrass was the quickest lawn grass species to establish, and Koreangrass was the slowest during the entire study period. Further, long term studies are suggested to observe the soil compaction on these soils.

Lawn grasses responded differently under various shade levels. Species dependent differences are observed for all parameters. Leaf elongation was maximum under shade conditions compared to full light (0% shade) in all lawn grasses. The ground coverage decreased with increase in shade level (from 0% to 75%). This reduction was high for perennial ryegrass. Under shade conditions chlorophyll content increased in Perennial ryegrass upto 50% shade and decreased in Bermuda and Koreangrass upto 75% shade and remained unchanged in Argentine bahiagrass. A strong reduction in root biomass was observed in all species with increase in shade.

Based on the performance, it was concluded that under 35% shade the performance of all grasses were satisfactory while under 50% shade, Argentine bahia and Koreangrass were found highly satisfactory, under full sunlight (0% shade) Bermuda performed well. Although Koreangrass had slow grow rate, it was found to be the best species under shade for its outstanding turf quality. All the turfgrass species declined in quality under high shade levels (75%) as indicated by increase in thin, succulent vertical growth, and less dense turf stand.

114) “Effect of sowing time, seed rate and harvesting duration on growth, yield and quality of Ashwagandha (Withania somnifera Dunal)” - T. Swathi.

ABSTRACT

A field experiment entitled “Effect of sowing time, seed rate and harvesting duration on growth, yield and quality of Ashwagandha (Withania somnifera Dunal)” was conducted at Herbal Garden, Dr. Y. S. R Horticultural University, Rajendranagar, Hyderabad during the year 2009-10. The experiment was laid out in Completely Randomized Block Design with factorial concept comprising eighteen treatments with sowing time, seed rate and harvesting duration. The treatment combinations included two dates of sowing August 15th and August 30th, three seed rates viz., S1 (10 kg/ha), S2 (12 kg/ha) and S3 (14 kg/ha), three harvesting durations viz., H1 (150 DAS), H2 (180 DAS) and H3 (210 DAS).

The results of the experiment revealed that August 15th sown crop recorded early germination and maximum germination percentage.

Maximum plant height and leaf area were recorded in August 15th sown crop. Among the interactions, August 15th sown crop with a seed rate of 14 kg/ha and harvesting duration of 180 DAS (D1S2H2) recorded maximum plant height and leaf area. Maximum number of branches was recorded when harvested at 210 days after sowing. Among the interactions, the crop sown on August 30th with a seed rate of 14 kg/ha and harvested at 210 DAS (D2S3H3) recorded highest number of branches.
Flowering and fruiting characters like early flowering and 50 per cent flowering, early fruit set and 50 per cent fruit set were recorded in August 15th sown crop. Among the interactions, August 15th sown crop with a seed rate of 12 kg/ha and harvesting duration of 180 DAS (D_1S_2H_2) and August 15th sown crop with a seed rate of 12 kg/ha and harvesting duration of 210DAS (D_1S_2H_3) recorded early flowering. August 30th sown crop with a seed rate of 10 kg/ha and harvesting duration of 210 DAS (D_2S_1H_3) recorded early 50 per cent flowering and early fruit set and 50 per cent fruit set.

Yield characters like length of the root, thickness of the root, fresh root yield, dry root yield, days for harvesting of seed and total biomass production recorded maximum in August 15th sown crop. Minimum was resulted in August 30th sown crop. Among the interactions, August 15th sown crop with a seed rate of 12 kg/ha and harvesting duration of 210 DAS (D_1S_2H_3) recorded maximum length of the root, thickness of the root, fresh and dry root yields.

Early days for harvesting of seed and maximum total biomass production were recorded in August 15th sown crop with a seed rate of 12 kg/ha and harvesting duration of 180 DAS (D_1S_2H_2).

Quality parameters like starch content, reducing sugars and non reducing sugars resulted highest in August 30th sown crop. Among the interactions, August 30th sown crop with a seed rate of 12 kg/ha and harvesting duration of 210 DAS (D_2S_1H_3) recorded highest starch content and non reducing sugars. Highest reducing sugars were recorded in August 30th sown crop with a seed rate of 12 kg/ha and harvesting duration of 150 DAS (D_2S_1H_1). Similar results were recorded in August 30th sown crop with a seed rate of 10 kg/ha and harvesting duration of 150 DAS (D_2S_1H_1).


ABSTRACT

A field experiment, “Studies on the effect of fertilizer levels and plant densities on growth and yield of ambrette (Abelmoschus moschatus Medic.)” was conducted at Herbal Garden, College of Horticulture, Dr. Y. S. R Horticultural University, Rajendranagar, Hyderabad during the year 2010-2011. The experiment was laid out in split plot design with nine treatments and replicated four times.

The treatment consisted of (T_1)- 50 × 30 cm + N P K at 75: 50: 40 kg per ha, (T_2)- 50 × 30 cm + N P K at 100: 50: 50 kg per ha, (T_3)- 50 × 30 cm + N P K at 125: 60 kg per ha, (T_4)- 50 × 40 cm + N P K at 75: 50: 40 kg per ha, (T_5)- 50 × 40 cm + N P K at 100: 50: 50 kg per ha, (T_6)- 50 × 40 cm + N P K at 125: 50: 60 kg per ha, (T_7)- 50 × 30 cm + N P K at 75: 50: 40 kg per ha, (T_8)- 50 × 50 cm + N P K at 100: 50: 50 kg per ha, (T_9)- 50 × 50 cm + N P K at 125: 50: 60 kg per ha.
The results of the experiment revealed that the maximum plant height and internodal length was recorded with fertilizer dose of N P and K at 125: 50: 60 kg per ha. A spacing of 50 × 30 cm recorded maximum plant height and internodal length. The interaction of spacing of 50 × 30 cm and fertilizer dose of 125: 50:60 kg per ha recorded maximum plant height and internodal length.

The leaf area was maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P and K at 100: 50: 50 kg per ha recorded maximum leaf area. Interaction of fertilizer level of N P K at 100: 50: 50 kg per ha and a spacing at 50 × 50 cm recorded maximum leaf area.

The dry matter production recorded maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 125: 50: 60 kg per ha recorded maximum dry matter production. Interaction of fertilizer level of N P K at 125: 50: 60 kg per ha and a spacing at 50 × 50 cm recorded maximum dry matter production.

Days to initiation of flowering and days to 50 per cent flowering were minimum at a spacing of 50 × 30 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded minimum days to initiation of flowering and days to 50 per cent flowering. Interaction of spacing of 50 × 30 cm and fertilizer dose of N P K at 100: 50: 50 kg per ha recorded minimum days to initiation of flowering and days to 50 per cent flowering.

Number of seeds per pod and seed weight per pod was maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 125: 50: 60 kg per ha recorded maximum number of seeds per pod and seed weight per pod. Interaction of spacing of 50 × 50 cm and fertilizer dose of N P K at 125: 50: 60 kg per ha recorded maximum number of seeds per pod and seed weight per pod.

Seed yield per plant and were recorded to be maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded maximum seed yield per plant and seed yield per ha.

Seed yield per plot and seed yield per ha was maximum at a spacing of 50 × 30 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded maximum seed yield per plot and seed yield per ha. Interaction of fertilizer levels of N P K at 100: 50: 50 kg per ha and a spacing of 50 × 30 cm recorded maximum seed yield per plot and seed yield per ha.

Oil content was maximum at a spacing of 50 × 30 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded maximum oil content (%). Interaction of fertilizer levels of N P K at 100: 50: 50 kg per ha and a spacing of 50 × 30 cm recorded maximum oil content.

The nitrogen content in leaves was maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded
maximum nitrogen content. Interaction of fertilizer levels of N P K at 100: 50: 50 kg per ha and a spacing of 50 × 50 cm recorded maximum nitrogen content in leaves after harvest.

The phosphorus content in leaves was maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded maximum phosphorus content. Interaction of fertilizer levels of N P K at 100: 50: 50 kg per ha and a spacing of 50 × 40 cm recorded maximum phosphorus content in leaves after harvest.

The potassium content in leaves was maximum at a spacing of 50 × 50 cm. A fertilizer dose of N P K at 100: 50: 50 kg per ha recorded maximum potassium content. Interaction of fertilizer levels of N P K at 100: 50: 50 kg per ha and a spacing of 50 × 50 cm recorded maximum potassium content in leaves after harvest.

116) “Effect of dehydration and storage on quality of banana flour (Musa paradisiaca Var Kovvur Bontha)” – B. Uma Bharani.

ABSTRACT

Investigation was carried out in laboratory of post harvest technology, College of Horticulture, Rajendranagar, during the year 2011-2012 to find out the “Effect of dehydration and storage on quality of banana flour (Musa paradisiaca Var Kovvur Bontha)” . A set of two experiments were conducted.

First set of experiment was conducted to improve the quality of banana flour in Completely Randomized Design with factorial concept using different pretreatments and drying methods. Different pretreatments used were blanching and sulphitation at different times and their combinations. Each pretreated banana fruit slices were dried individually in tray drier and infrared drier and ground into flour. Various physico-chemical parameters like recovery (%), TSS (ºbrix), acidity (%), total sugars (%), reducing sugars (%), non-reducing sugars (%), ascorbic acid content (mg/100g), organoleptic evaluation, crude protein (%), ash content (%) were analysed for the flour thus obtained from different pretreatments and drying methods.

Among different pretreatments, sulphitation of samples in 0.25 % KMS for 10 and 20 minutes showed better results with respect to the TSS, sugars and ascorbic acid content of the flour, blanching at 60ºC for 5 minutes + 0.25% KMS for 20 minutes showed better results with respect to crude protein and organoleptic qualities of the banana flour while blanching at 60ºC for 5 minutes resulted in better retention of acidity.
Drying methods did not show any significant difference on nutritive value of the flour except for TSS and sugars which were recorded better in tray drying than infrared drying.

Flour obtained from the fruit slices blanched at 60°C for 5 minutes + 0.25% KMS dip for 20 minutes before dehydration followed by tray drying was of best quality since this combination recorded maximum score for various parameters studied.

Second set of experiment was conducted in Completely Randomized Design to study the effect of different packaging materials on nutritional and physico-chemical composition of banana flour during storage. Best combination from the earlier experiment viz., blanching of banana slices at 60°C for 5 minutes + 0.25% KMS dip for 20 minutes followed by tray drying was used to prepare banana flour which was then packed in six different packaging materials viz., 200 gauge polythene bags, 300 gauge polythene bags, 100 gauge polypropylene bags, 200 gauge polypropylene bags, aluminium foil covers and glass bottles and stored at ambient conditions for six months. Various physico-chemical parameters like moisture (%), loss or gain in weight (%), TSS (ºbrix), total sugars (%), reducing sugars (%), non reducing sugars(%), ascorbic acid content(mg/100g), acidity (%), microbial load (cfu), crude protein (%), ash content (%) were analysed in monthly intervals.

During storage, moisture, weight, ash, TSS and sugars of the flour showed an increasing trend while acidity, ascorbic acid, and crude protein showed a decreasing trend. There was no microbial contamination for the initial two months which increased further during storage. However the microbial load remained within the prescribed limits as given by ICMSF. Aluminium foil covers were found to be best followed by glass bottles in retaining various nutrients and quality attributes and recording lesser microbial load when compared to the other packaging materials.

The flour prepared from bananas, pretreated by blanching at 60°C for 5 minutes + 0.25% KMS dip for 20 minutes and dehydrated in a tray drier, packed in aluminium foil covers and glass bottles could be stored successfully for six months at ambient conditions.

“Studies on the enzymatic extraction of juice, standardization of RTS beverage Sapota and value addition with other juices” - Kiranmayi Rejeti.

**ABSTRACT**

Sapota (*Manilkara achras (Mill.) Forsberg*) is one of the important fruits of tropics. Being a climacteric fruit, it has low shelf life and highly perishable in nature. The fruits should be processed and value added in order to reduce postharvest losses, thus diverting the fruit from fresh market to industry which increases revenue to sapota growers and improve sapota acceptance by the consumer. In view of above, an experiment was carried out entitled "Studies on the enzymatic extraction of juice, standardization of RTS beverage of sapota and value addition with other juices" during 2011-2012 at Horticultural College and Research Institute,
Experiment was carried out to know the effect of pectinase enzyme on juice yield and quality, to standardize sapota RTS beverage with enzymatically extracted juice and to prepare various blends with grape, pineapple, carrot, beetroot and papaya juices and finally to study the physico-chemical parameters and shelf life of fruit blends during storage.

It was observed that with increasing pectinase enzyme concentration, duration and temperature the per cent juice yield and ascorbic acid increased whereas, pectin content decreased. TSS remained constant in all the treatments. Sapota juice yield increased by 15 per cent when the pectinase enzyme was used. The RTS beverage prepared with pulp from 1000 ppm enzyme incubated for four hours at 40 °C was found best organoleptically followed by RTS beverage prepared with pulp using 2000 ppm pectinase enzyme incubated for 4 hours duration at 40 °C.

Different fruit juice blends were prepared with sapota in combination with papaya, pineapple, grape, carrot and beetroot in different proportions for improving colour, flavour, palatability and nutritive value. Among different blends, highest ascorbic acid content was observed in RTS using sapota and pineapple blended in the ratio of (70:30), β-carotene in sapota and carrot blend (60:40), anthocyanins in sapota and beetroot blend (70:30) and antioxidant activity in sapota and carrot blend (60:40). Sensory evaluation score was highest in RTS using sapota and grape blended in the ratio of (70:30) due to better colour and flavour.

During storage the total soluble solids were found to be consistent throughout the storage period while reducing sugars increased continuously during the storage period of four months, while titrable acidity, total sugars, ascorbic acid, anthocyanins, β-carotene and antioxidant activity decreased. There was slight decrease in organoleptic acceptability of the juice blends due to the changes in the composition of these parameters. However, the RTS beverages were acceptable up to four months of storage period.


ABSTRACT

A field experiment entitled “Integrated weed management in Brinjal (Solanum melongena L.)” was conducted at the Vegetable Research Station, Dr.Y.S.R. Horticultural University, Rajendranagar, Hyderabad during the year 2011-12 with 13 treatments viz., pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha⁻¹ + one hand weeding at 45 DAT (T₁), oxadiargyl as pre-emergence @ 90 g a.i ha⁻¹ + one hand weeding at 45 DAT(T₂), oxyfluorfen as pre-emergence @ 0.15 kg a.i ha⁻¹ + one hand weeding at 45 DAT(T₃), pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha⁻¹ followed by quizalofop ethyl @ 50 g a.i ha⁻¹ at 15 to 20 DAT (T₄), oxadiargyl as pre-emergence @ 90 g a.i ha⁻¹ followed by quizalofop- ethyl @ 50 g a.i ha⁻¹ at 15 to 20 DAT (T₅), oxyfluorfen as pre-emergence @ 0.15 kg a.i ha⁻¹ followed by quizalofop -ethyl @ 50 g a.i ha⁻¹ at 15 to 20 DAT (T₆), pendimethalin C.S as pre-emergence @0.70 kg a.i ha⁻¹ followed by propaquizafop @ 62.5 g a.i ha⁻¹ at 15 to 20 DAT (T₇), oxadiargyl as pre-emergence @ 90 g a.i ha⁻¹ followed by propaquizafop @ 62.5 g a.i ha⁻¹ at 15 to 20 DAT (T₈), oxyfluorfen as pre emergence @ 0.15 kg a.i ha⁻¹ followed by propaquizafop @ 62.5 g a.i ha⁻¹ directed spray 25 and 50 DAT (T₁₀), intercultivation at 25 and 50 DAT (T₁₁), Hand weeding three
times at 20, 40 and 60 DAT (T_{12}) and control (T_{13}). The experiment was laid out in a randomized block design with three replications.

Among the different weed species *Parthenium hysterophorus*, *Digera arvensis*, *Euphorbia hirta*, *phyllanthus niruri* and *Amaranthus viridis* were dominant. In grasses *Cynodon dactylon* and *Dactyloctenium aegyptium*, whereas in sedges *Cyperus rotundus* were dominant.

The highest weed control efficiency was recorded at 30 DAT with glyphosate @ 1.5 kg a.i ha\(^{-1}\) directed spray at 25 and 50 DAT (T_{10}). At 60 DAT the highest weed control efficiency was recorded with pendimethalin C.S as pre-emergence @0.70 kg a.i ha\(^{-1}\) + one hand weeding at 45 DAT (T_{1}). At 90 DAT and final harvesting stage, the highest weed control efficiency recorded in the treatment hand weeding three times at 20, 40 and 60 DAT (T_{12}). The lowest weed index was recorded with glyphosate @ 1.5 kg a.i ha\(^{-1}\) directed spray at 25 and 50 DAT (T_{10}) followed by pendimethalin C.S as pre-emergence @0.70 kg a.i ha\(^{-1}\) + one hand weeding at 45 DAT (T_{1}) whereas the highest weed index was recorded with glyphosate @ 1.5 kg a.i ha\(^{-1}\) directed spray at 25 and 50 DAT (T_{10}) followed by control (T_{13}).

Hand weeding three times at 20, 40 and 60 DAT (T_{12}) followed by intercultivation at 25 and 50 DAT (T_{11}) and pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha\(^{-1}\) + one hand weeding at 45 DAT (T_{1}) recorded the highest plant height with more number of primary branches per plant, plant spread and more marketable yield with increased average fruit weight and more number of fruits per plant. Among the different integrated weed management practices, hand weeding three times at 20, 40 and 60 DAT (T_{12}) recorded the highest nutrient uptake (N, P and K) followed by intercultivation at 25 and 50 DAT (T_{11}) and pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha\(^{-1}\) + one hand weeding at 45 DAT (T_{1}).

Among the different treatments, the highest B:C ratio was recorded in intercultivation at 25 and 50 DAT (T_{11}) followed by pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha\(^{-1}\) + one hand weeding at 45 DAT (T_{1}) whereas the lowest net returns, and B:C ratio were recorded in glyphosate @ 1.5 kg a.i ha\(^{-1}\) directed spray at 25 and 50 DAT (T_{10}), followed by control (T_{13}) whereas the lowest cost of cultivation was recorded in control (T_{13}).


### ABSTRACT

A field experiment entitled **“Influence of plant growth regulators and micronutrients on seed maturity and quality in African marigold”** was conducted at Floriculture Research Station, Rajendranagar, Hyderabad during the year 2011-12. The experiment was laid out in randomized block design with twelve treatments and replicated thrice. The treatments were T\(_1\) (GA\(_3\) at 200 ppm), T\(_2\) (NAA at 100 ppm), T\(_3\) (MH at 1000 ppm), T\(_4\) (ZnSO\(_4\) at 0.5%), T\(_5\) (Boron at 0.2%), T\(_6\) (GA\(_3\) at 200 ppm and ZnSO\(_4\) at 0.5%), T\(_7\) (GA\(_3\) at 200 ppm and boron at 0.2%), T\(_8\) (NAA at 100 ppm and ZnSO\(_4\) at 0.5%), T\(_9\) (NAA at 100 ppm and boron at 0.2%), T\(_10\) (MH at 1000 ppm and ZnSO\(_4\) at 0.5%), T\(_11\) (MH at 1000 ppm and boron at 0.2%) and T\(_12\) (control). Treatments were imposed as foliar sprays at 15, 30 and 45 days after transplanting.

The results of the experiment revealed that among different treatments, maximum flower weight (4.42 g), seed yield per flower (0.99 g), number of filled seeds (200.13), thousand seed weight (3.14 g), germination percentage (77.18%), seedling length (8.75 cm),
seedling dry weight (0.0129 g) and seedling vigor index (695) were recorded with the treatment T_{11} (MH at 1000 ppm and boron at 0.2%) and was found to be on par with treatment T_1 (GA_3 at 200 ppm). Treatment T_9 (NAA at 100 ppm and boron at 0.2%) was also found on par with T_{11} (MH at 1000 ppm and boron at 0.2%) in respect of flower weight, thousand seed weight, seedling length, dry weight of ten seedlings and seedling vigour index.

Lowest moisture content (28.55%) was recorded with the treatment T_{11} (MH at 1000 ppm and boron at 0.2%) to which treatment T_1 (GA_3 at 200 ppm) was found on par. Lowest number of unfilled seeds (61.67) was recorded with the treatment T_{10} (MH at 1000 ppm and ZnSO_4 at 0.5%) to which treatments T_4 (ZnSO_4 at 0.5%), T_5 (Boron at 0.2%), T_7 (GA_3 at 200 ppm and boron at 0.2%) and T_9 (NAA at 100 ppm and boron at 0.2%) were found on par.

Among various DAA, highest flower weight (4.40 g), seed yield per flower (0.69 g), number of filled seeds (173.56), thousand seed weight (2.93 g), germination percentage (83.25), seedling length (9.59 cm), dry weight of ten seedlings (0.0126 g) and seedling vigor index (799) were recorded at 28 DAA. Minimum number of unfilled seeds (48.19) and lowest moisture content (14.18 %) were registered at 42 DAA.

The results from the present study clearly showed that highest flower weight, seed yield and quality parameters were recorded at 28 DAA (optimum physiological maturity) with foliar application of MH at 1000 ppm and boron at 0.2% (T_{11}) and GA_3 at 200 ppm (T_1).


ABSTRACT

A field experiment was conducted during “rabi” (January-February) of 2012 in sandy loam soils of Model orchard, College of Horticulture, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad, Andhra Pradesh to study the “Effect of plant growth regulators on growth, herbage yield and quality of coriander” cv. Swathi (CS-6). The experiment was laid out in split plot design consisting of modes of application of plant growth regulators viz., pre plant soaking (8hrs), spraying at 20 DAS and pre plant soaking (8 hrs.) + spraying at 20 DAS as main plot treatments and various plant growth regulators i.e., GA_3 (30 and 45 ppm), NAA (20 and 30 ppm), TRIA (1 and 2 ppm) and BA (5 and 10 ppm) as sub plot treatments. The results emanated from the experiment revealed that the different plant growth regulators applied by various modes were found to have a significant effect on all the growth, yield and quality parameters. Among the modes of application of plant growth regulators, pre plant soaking (8 hrs.) + spraying at 20 DAS recorded the maximum growth and yield parameters like plant height, number of leaves and nodes plant^{-1}, fresh weight of leaves and shoot plant^{-1}, leaf to shoot ratio, total dry matter plant^{-1} and herbage yield ha^{-1} as well as the biochemical parameters like leaf chlorophyll, ascorbic acid and leaf essential oil content followed by spraying at 20 DAS and the respective minimum values were recorded in pre plant soaking (8hrs). Among the different plant growth regulators applied at various concentrations, GA_3 @ 45 ppm recorded the highest values followed by NAA @ 20 ppm regarding all the above growth, yield and biochemical parameters. Similarly, the interaction between various concentrations of different plant growth regulators and their mode of application, pre plant soaking (8 hrs.) + spraying at 20 DAS with 45 ppm GA_3 was the best compared to any other combination followed by pre plant soaking (8 hrs.) + spraying at 20 DAS with NAA @ 20 ppm regarding all the growth, yield and quality parameters. However, the maximum net returns was obtained in pre plant soaking (8 hrs.) + spraying at 20 DAS with NAA @ 20 ppm followed
by pre plant soaking (8 hrs.) + spraying at 20 DAS with GA$_3$ @ 45 ppm and the highest benefit cost ratio was obtained in pre plant soaking (8 hrs.) + spraying at 20 DAS with NAA @ 20 ppm followed by spraying at 20 DAS with NAA @ 20 ppm. The results of the present investigation demonstrated that pre plant soaking (8 hrs.) + spraying at 20 DAS with GA$_3$ 45 ppm solution can be considered as the best treatment for obtaining higher herbage yield of better quality in coriander.

121) “Studies on pre and post-harvest treatments on ripening in sapota cv. Kalipatti” – M.Harika.

**ABSTRACT**

The present investigation entitled “Studies on pre and post-harvest treatments on ripening in sapota cv. Kalipatti” was carried out in the Post Harvest Technology Laboratory, College of Horticulture, Rajendranagar during the year 2011-2012.

A set of three experiments namely pre-harvest spray of potassium sulphate, post-harvest ethrel treatment and combination of best of pre-harvest potassium sulphate spray+ post-harvest ethrel treatments on ripening in sapota cv. Kallipatti at ambient temperature were conducted. The experiments were laid out in completely randomized design with factorial concept. Various physical parameters like PLW (%), ripening (%), spoilage (%), firmness (Kg cm$^{-2}$) and biochemical parameters like TSS ($^0$Brix), acidity (%), brix-acid ratio, sugars(%) and ascorbic acid (mg/100 g) were estimated at 2 days interval during ripening.

All the treatments accelerated the ripening when compared to control. The data on quality parameters like PLW, total sugars, titrable acidity, TSS also confirm the enhanced effect on ripening with above treatments.

In the present study of pre-harvest spray of fruits with potassium sulphate at 10 and 15 per cent 30 days before harvest (T$_5$&T$_8$) were effective in enhancing the ripening process. The data on ripening, total sugars, titrable acidity, TSS, firmness, ascorbic acid, organoleptic score were maximum in potassium sulphate treated fruits compared to control. Among the respective treatments the highest total, reducing, non-reducing (%) and TSS ($^0$B) recorded in fruits sprayed with 10% and 15% K$_2$SO$_4$ 30 days before harvest (T$_5$&T$_8$).

Post harvest dip treatments of sapota fruits with ethrel 1000ppm and 1750 ppm showed lowest acidity and ethrel 2000 ppm showed lowest ascorbic acid content. Ethrel 1000 ppm effectively enhanced the ripening and fruit quality. The spoilage was maximum in ethrel 2000 ppm concentration. Ethrel 1000 ppm and 1750 ppm recorded high in organoleptic score.

The first two best treatments from the above two experiments were tried in combination as fruits sprayed with10% K$_2$SO$_4$ 30 days before harvest+ post-harvest ethrel 1000 ppm, fruits sprayed with10% K$_2$SO$_4$ 30 days before harvest+ post-harvest ethrel 1750 ppm, fruits sprayed with15% K$_2$SO$_4$ 30 days before harvest+ post-harvest ethrel 1000 ppm, fruits sprayed with15% K$_2$SO$_4$ 30 days before harvest+ post-harvest ethrel 1750 ppm.

The percentage of ripe fruits were enhanced in pre-harvest sprayed fruits with potassium sulphate+ post-harvest treatment with ethrel with highest percentage of ripened fruits recorded in fruits sprayed with 15% K$_2$SO$_4$ 30 days before harvest + post-harvest treatment of 1750 ppm ethrel.
ABSTRACT

A set of three experiments were conducted at Horticultural College and Research Institute, Venkataramannagudem, West Godavari district of Andhra Pradesh with an objective of studying the influence of different packaging materials, chemical treatments and storage temperatures on quality and shelf life of minimally processed jackfruit bulbs. The experiments were conducted in CRD with factorial concept and replicated thrice. The physico-chemical characters of the bulbs as influenced by various treatments were recorded during storage.

Irrespective of the treatments used, the physiological loss in weight increased, while the bulb firmness, organoleptic score decreased with advancement of storage period. The quality in terms of TSS, reducing sugars, non-reducing sugars, acidity and ascorbic acid decreased towards the end of storage period. However, the rate of decrease was much lower in packed and chemical treated bulbs when compared to those untreated and stored in open trays.

Among packaging materials, bulbs with seed packed in 100 gauge polypropylene bags recorded lowest PLW (3.33 %) and highest firmness (3.67 kg cm$^{-2}$), TSS (26.05 °Brix), reducing sugars (8.07 %), non-reducing sugars (8.21%), total sugars (16.28%), titratable acidity (0.54%) and ascorbic acid (6.05%) and thereby recorded highest shelf life (52.23 hours). Organoleptic score was also highest for bulbs with seed packed in 100 gauge polypropylene bags (4.32).

In case of chemical treatments, bulbs treated with 10,000 ppm calcium chloride recorded lowest PLW (2.10%) and highest firmness (4.52 kg cm$^{-2}$), TSS (26.28 °Brix), reducing sugars (8.12%), non-reducing sugars (8.21%) total sugars (16.33%), titratable acidity (0.63%) and ascorbic acid (6.19%) and thereby recorded highest shelf life (64.78 hours). Organoleptic score was also highest for bulbs treated with 10,000 ppm CaCl$_2$ (4.38) followed by those treated with 200 ppm ascorbic acid which recorded a shelf life 62.23 hours.

Among storage temperatures, bulbs treated with 10,000 ppm calcium chloride stored at 4°C recorded lowest PLW (2.22%) and highest firmness (4.40 kg cm$^{-2}$), TSS (25.79° Brix), reducing sugars (8.01%), non-reducing sugars (8.01%) total sugars (16.02%) and titratable acidity (0.55%) and thereby recorded highest shelf life (23.56 days). However, highest ascorbic acid content was recorded by bulbs treated with 200 ppm ascorbic acid stored at 4°C (6.07%).

Both packing materials and chemical treatments improved the shelf life of jackfruit bulbs while their combined use along with cold storage further increased their efficiency leading to improved shelf life. Thus the bulbs treated with 10,000 ppm CaCl$_2$, packed in 100 gauge polypropylene bags and stored at 4°C recorded highest shelf life and minimum spoilage compared to other treatments.

123) “Studies on the effect of pre and post harvest application of growth regulators on shelf life of sapota (Manilkara achras (Mill.) Fosberg) cv.Kalipatti” – Shalini Sasubilli
ABSTRACT

The present investigation entitled “Studies on the effect of pre and post harvest application of growth regulators on shelf life of sapota (Manilkara achras (Mill.) Fosberg) cv. Kalipatti” was conducted at Post Harvest Lab, Horticultural College and Research Institute (HC&RI), West Godavari district of Andhra Pradesh during the year 2011-2012.

Experiments were carried out to know the effect of pre and post harvest application of different growth regulators like gibberllic acid (100, 200, 300 ppm), 2,4-D (2, 4, 8 ppm) and kinetin (50, 100, 200 ppm) on physico-chemical parameters and shelf life of sapota fruits at ambient storage conditions.

A set of two experiments were conducted in completely randomized factorial design and the treatments were replicated three times. Physico-chemical parameters were recorded on alternate days in both experiments at ambient storage conditions.

It was observed that the physiological loss in weight, spoilage rates and TSS: acid ratio showed increasing trend throughout the storage period. Total soluble solids, reducing, non-reducing sugars and total sugars increased up to a certain period of ripening and thereafter decreased towards the end of the shelf life, whereas acidity, firmness and ascorbic acid continously decreased up to the end of the storage life.

In pre harvest treatments, fruits treated with GA$_3$ (300 ppm) recorded lower values for physiological loss in weight (1.85%), spoilage (1.11%), total soluble solids (18.91 °Brix), TSS: acid ratio (75.64) reducing sugars (4.64%), non-reducing sugars (3.75%) and total sugars (8.39%). Similarly, the above treatment recorded higher values for firmness (7.37 kg/cm$^2$), acidity (0.25%), and ascorbic acid (22.57 mg/100g) and thereby recorded more shelf life (13 days) than rest of the treatments. Organoleptic scoring was higher in GA$_3$ 300 ppm (8.25). Next to GA$_3$ 300 ppm treatment, the GA$_3$ 200 ppm recorded higher shelf life of 13.12 days.

In post harvest treatments, fruits treated with GA$_3$ (300 ppm) recorded lower values for physiological loss in weight (2.28%), spoilage (1.78%), total soluble solids (19.15 °Brix) and TSS: acid ratio (79.80), reducing sugars (5.47%), non-reducing sugars (3.44%) and total sugars (8.91%). Similarly, the above treatment recorded higher values for firmness (6.41 kg/cm$^2$), acidity (0.24%), and ascorbic acid (22.60 mg/100g) and thereby, recorded more shelf life (13 days) than rest of the treatments. Organoleptic scoring was higher in 2,4-D 2 ppm (8.22). Next to GA$_3$ 300 ppm treatment, GA$_3$ 200 ppm recorded higher shelf life of 12.11 days.

Thus in both pre and post harvest treatments, fruits treated with GA$_3$ (300 ppm) recorded higher shelf life and better fruit quality parameters as compared to other treatments.


ABSTRACT

The present investigation entitled, “Effect of post harvest treatments and packaging materials on shelf life and quality of tomato (Solanum lycopersicum L.) cv. Lakshmi under ambient conditions” was carried out during 2011-2012 at Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The present study was conducted to know the effect of different post harvest chemicals and packaging materials on physio-chemical parameters and shelf life of tomato fruit at
ambient temperatures. In the experiment-1 there are 9 treatments they are T₁- Benzyl Adenine (50 ppm), T₂- Benzyl Adenine (100 ppm), T₃- Sodium benzoate (1000 ppm), T₄- Sodium benzoate (2000 ppm), T₅- Calcium chloride (1.0%), T₆- Calcium chloride (2.0%), T₇- Gibberellic acid (0.1%) , T₈- Gibberellic acid (0.3%) , T₉- Control (distilled water) and in experiment-2 different packaging materials used in combination with best post harvest chemical of experiment-1. In the experiment-2 there are 7 treatments they are P₁- LDPE 80 gauge (0.25% ventilation), P₂-LDPE 150 gauge (0.25% ventilation), P₃-LDPE 300 guage (0.25% ventilation), P₄-LDPE 80 guage (0.5% ventilation), P₅-LDPE 150 guage (0.5% ventilation), P₆–LDPE 300 guage (0.5% ventilation), P₇-Control (without packaging).

A set of two experiments were conducted in CRD with factorial concept and the treatments were replicated three times and physio-chemical characteristics were recorded at 4 days interval upto 28 days in experiment-1 and 20 days in experiment-2 at ambient conditions.

The physio-chemical characters studied are physiological loss in weight, fruit firmness, shelf life, total soluble solids, ascorbic acid, titrable acidity, reducing sugars, total sugars and lycopene content, it was observed that the physiological loss of weight and lycopene content increased towards the end of storage period. Fruit firmness, shelf life, ascorbic acid and titrable acidity decreased towards the end of storage period. Total soluble solids, reducing sugars and total sugars were increased initially and then decreased towards the end of storage period.

In experiment-1, tomato fruits treated with GA₃ (0.3%) recorded lower physiological loss of weight (7.90%), fruit firmness (3.25), total soluble solids (5.43), ascorbic acid(25.82), titrable acidity (0.46), reducing sugars (5.35), total sugars (9.30) and lycopene content (9.30) and there by recorded more shelf life (43 days) than rest of the treatments. Next to T₈, CaCl₂ 2% (T₆) also recorded higher shelf life upto 40 days.

In experiment-2, tomato fruits treated with GA₃ (0.3%) and packed in LDPE 300 guage (0.5% ventilation) recorded lower physiological loss of weight (9.30%) fruit firmness (3.29), total soluble solids (5.41), ascorbic acid (0.46), titrable acidity (0.46%), reducing sugars (5.30), total sugars (9.30) and lycopene content (3.11) and there by recorded more shelf life (30 days) than rest of the treatments. Next to T₆, LDPE 150 guage (0.5% ventilation) (T₃) also recorded higher shelf life upto 30 days.

125) “Studies on performance of gladiolus cultivars and effect of GA₃ on growth, flowering and yield attributes of gladiolus (Gladiolus grandiflorus L.)” – R.Swapnika.

ABSTRACT

The present investigation “Studies on performance of gladiolus cultivars and effect of GA₃ on growth, flowering and yield attributes of gladiolus (Gladiolus grandiflorus L.)” was conducted at AICRP on floriculture, ARI, Dr.Y.S.R. Horticultural University, Rajendranagar during 2007-2008. The objectives of the experiments were to identify the suitable gladiolus cultivars and to know the effect of GA₃ on gladiolus. In the first experiment, ten gladiolus cultivars (T₁-Hybrid-1, T₂- IIHR 87-22-1, T₃- Peter Pears, T₄- Bindya, T₅- Spic and Span, T₆- Shubangini, T₇-White Knight, T₈- Apple Blossom, T₉- Sadabahar, T₁₀- Swarnima) were evaluated for growth, flowering and yield potential of the cultivars. Second experiment was laid out with two cultivars (Spic & Span and Peter Pears) treated with three concentrations of GA₃ (G₀-Control, G₁-50 ppm, G₂-100 ppm, G₃150 ppm) at 3rd and 6th leaf stage to know the optimum dose for maximization of spike yield under Hyderabad conditions.
In evaluation studies with 10 cultivars, significant variations in growth, flowering and yield were observed. Among the cultivars studied, the cultivar Bindya recorded the maximum plant height (64.10 cm) with more number of leaves per plant (8.03) while, maximum leaf area was recorded in the cultivar IIHR-87-22-1 (641.79 cm²).

Number of days taken for spike emergence (45.36 days) and 50 percent flowering (57.78 days) was significantly early in the cv Bindya, while the maximum spike length (102.5 cm) with more number of florets (15.26), was recorded in the cv IIHR 87-22-1. However, maximum floret diameter (10.23 cm) was recorded in the cv Bindya.

The yield attributes of the gladiolus significantly varied with the cultivars. Maximum number of spikes were recorded with the cv IIHR 87-22-1 and Bindya (2 spikes plant⁻¹) and Swarnima (1.83spikes plant⁻¹). Significant differences were observed for the corm and cormel characters. The cv Bindya recorded maximum number of corms (2.66) and weight of corms (47.71g), while cv Hybrid I recorded maximum corm diameter (5.29cm), maximum number of cormels (34.33) and weight of cormels (44.97 g ).

Regarding the post harvest vase life, cv Swarnima recorded the maximum vase life (9.5 days) while the cv White Knight recorded the minimum vase life (4.91 days).

From the second experiment, it was observed that among the different concentration of GA₃ studied, plant height (54.62cm), number of leaves (8.13) and leaf area (540.56 sq cm) were highest with GA₃ 150 ppm. Further, it was observed that application of GA₃ 150 ppm resulted in early spike initiation (61.51 days), 50 percent flowering (75.94 days), increased spike length (81.71 cm), maximum floret size (9.51cm), maximum number of spikes plant⁻¹ (1.24) and maximum number of corms (2.01). Regarding the yield of spikes cv Spic and Span was found to be significantly superior than the cv Peter Pears. The effect of GA₃ were found to be non significant for number of florets per spike. Whereas, parameters like the diameter of corm (4.56 cm), weight of corms (31.16 g), number (35.66) and weight of cormels (40.70 g) were highest when GA₃ was applied at 50 ppm.

Among the two cultivars, the cv Spic and Span recorded maximum plant height (55.55cm), leaf area (584.61 cm²), minimum number of days for spike initiation (60.56 days), 50 percent flowering (75.18 days), maximum floret size (9.78 cm), vase life (9.31 days) and number of corms (2.03) when GA₃ was applied at 150 ppm.

The interaction between the cultivars and GA₃ concentrations were found to be non significant for the characters like number of leaves, spike length, number of florets spike⁻¹ and yield of spikes hectare⁻¹.

126) “Utilization of cashew apple (Anacardium occidentale L.) for preparing cashew apple syrup by using different varieties.” – P. Ashok Naidu.

ABSTRACT

The focus of the present study is the utilization of cashew apple (Anacardium occidentale L.) for the preparation of cashew apple syrup by using eight distinct varieties viz., BPP-4, BPP-5, BPP-8, BPP-9, Dhana, Priyanka, VRI-1 and VRI-2. The experiment was conducted in a Completely Randomized Design (CRD) and stastically analysed. The varieties of cashew apple are studied for their physical parameters like fruit weight, fruit colour, fruit girth, fruit length, and fruit volume, juice colour and juice recovery percentage. The chemical parameters like TSS (°Brix), total titrable acidity (%), TSS/Acid ratio, ascorbic acid (mg/100 g), reducing sugars (%) and tannins (mg/ml) for juice, clarified juice and syrup were recorded.
The physical parameters like colour of product, product recovery from 100 fruits (wt) and microbial spoilage occurrence, organoleptic evaluation, storage behaviour and the cost benefit ratio were also studied for the cashew syrup.

Among the varieties studied, the significant highest fruit weight (76.48 g), fruit girth (5.79 cm), fruit length (7.53 cm), fruit volume (58.11 cm$^3$) and juice recovery percentage (79.73%) were recorded in the variety Priyanka followed by BPP-8.

Decreasing trend the parameters of TSS, acidity, ascorbic acid, and tannins and increasing trend for TSS/Acidity ratio and where as reducing sugar content remained constant were recorded in the juice.

Among the varieties, significantly the highest quantity of syrup was obtained with variety Priyanka (11.04 Kg) followed by BPP-8 (4.56 kg) from 100 fruits. Organoleptic evaluation of syrup was carried out at different days of storage interval in every variety. The overall acceptability ranged from 5.41 to 5.71, 5.86 to 6.04 and 6.34 to 6.47 at 0, 30 and 60 days after storage respectively. The overall acceptability of the product is increasing with the days of storage irrespective of varieties under study and the highest in Priyanka followed by BPP-5, BPP-8 and the lowest in BPP-4 variety as recorded during the present study.

In the present investigation, it is concluded that for the utilization of cashew apple by preparing the cashew apple syrup the varieties Priyanka and BPP-8 are economical for large scale production. The cashew apple syrup for its exclusive quality of the syrup the variety VRI-2 in found to be the best for the value addition through cashew apple syrup production.


**ABSTRACT**

An experiment was carried out during the *rabi* 2010-2011 at Horticultural Research Station (APHU), Venkataramannagudem, West Godavari district, A.P. with an objective of identifying a suitable onion variety to coastal region of Andhra Pradesh. The experiment was laid out in a randomized block design (RBD) with three replications and data on growth, yield, yield attributes and quality of nine onion cultivars were recorded and statistically analyzed.

The plant height of different varieties recorded at various stages of crop growth differed significantly. Though all the varieties were uniform during the initial stages of crop growth (15, 30 DAT), the cv. Arka Niketan was significantly superior recording maximum plant height at 60 DAT (31.60 cm) and 90 DAT (42.60 cm) whereas Multiplier onion recorded minimum plant height at all stages of growth.

The number of leaves per plant at successive growth stages differed significantly among the varieties. Highest number of leaves at 30 DAT (5.66), 60 DAT (10.6) and at 90 DAT (12.06) were recorded by Multiplier onion while the lowest were recorded by Agrifound Light Red at all the growth stages. Leaf area and leaf area index (LAI) were significantly influenced by varieties. At all stages of crop growth significantly maximum leaf area was recorded by Arka Niketan, whereas, the cv. Multiplier onion recorded the minimum leaf area and leaf area index.
The neck thickness was maximum in cv. Arka Kalyan (1.21 cm) followed by cv. Agrifound Rose (1.19 cm) while the lowest neck thickness was recorded in cv. Multiplier onion (0.73 cm). Significantly the longest crop duration was recorded by cv. Agrifound Light Red (140 days) followed by cv. N-53 (136 days). The cv. Multiplier onion was the earliest with crop duration of 98 days from planting to harvest.

Significant differences were observed among the varieties in respect of yield attributes such as horizontal and vertical bulb diameter, weight of the bulb and bulb yield. Maximum values for the above parameters were recorded by cv. Arka Niketan (25.47 t/ha) followed by Arka Kalyan (24.01 t/ha). The minimum values for yield attributes and yield per hectare were recorded by cv. Multiplier onion.

Total soluble solids (TSS), sugars (total, reducing and non reducing) in the bulbs were significantly influenced by the different varieties. The TSS (°Brix) and total sugars (%) were high in Arka Niketan (11.35 and 6.41). The non reducing sugars were maximum in cv. N-53 (2.33) while the highest ascorbic acid content was observed in cv. Arka Kalyan (10.67 mg/100 g).

Vegetative growth in terms of plant height, leaf area and leaf area index were positively associated with bulb weight and yield while the mean bulb weight showed significant positive correlation with yield.

Keeping in view the overall performance of different varieties in terms of vegetative growth, yield and quality of the bulbs, the cultivars Arka Niketan and Arka Kalyan were found superior and have been identified as suitable varieties for coastal region of Andhra Pradesh.

128) “Studies on effect of plant growth regulators and media on rooting of carnation (Dianthus caryophyllus. L.) Cultivars under poly house conditions” – K. Renuka.

ABSTRACT

“Studies on effect of plant growth regulators and media on rooting of carnation (Dianthus caryophyllus. L.) Cultivars under poly house conditions” was conducted at commercial floriculture farm, Midimyal (village), Moinabad (mandal), Rangareddy (dist), during 2011-2012 using three cultivars namely cvs. Dona, Baltico and Keiro.

In experiment – I the effect of media and their combinations on rooting of carnation (Dianthus caryophyllus L.) cultivars under poly house conditions with 33 treatments replicated thrice, was studied. Among the media studied red earth+ coco peat recorded less number of days for formation of root initials, highest percentage of rooting, maximum number of roots per cutting, cumulative length of roots per cutting, and highest percentage of establishment of rooted cuttings, followed by coco peat+ vermicompost. Media in combination recorded significantly superior rooting parameters over individual media.

In experiment – II the effect of plant growth regulators on rooting of carnation (Dianthus caryophyllus L.) cultivars under poly house conditions was studied, with 30 treatments replicated thrice. Among the plant growth regulators studied IBA 200ppm recorded less number of days for formation of root initials, highest percentage of rooting, maximum number of roots per cutting, cumulative length of roots per cutting and highest percentage of establishment of rooted cuttings followed by IBA100ppm+ NAA 50ppm.
In experiment – III the effect of type of cuttings on rooting of carnation (*Dianthus caryophyllus* L.) cultivars under poly house conditions with 18 treatments and replicated four times, Among the type of cuttings terminal cuttings recorded better rooting over basal cuttings in all the root parameters studied.

Terminal cuttings treated with IBA 200ppm planted in reedearth + coco peat media recorded less number of days for formation of root initials, maximum number of roots per cutting, cumulative length of roots, fresh weight of roots and percentage establishment of rooted cuttings.

129) “Influence of Rootstocks on Petiole Nutrient Content, Yield, Quality and Shelf Life of Table Varieties of Grapes” – B. Manju Vani.

**ABSTRACT**

The present investigation entitled “Influence of Rootstocks on Petiole Nutrient Content, Yield, Quality and Shelf Life of Table Varieties of Grapes” was carried out at Grape Research Station, Dr. Y. S. R Horticultural University, Rajendranagar, Hyderabad during April 2011 – March 2012.

An experiment was carried out with three rootstocks (1103 P, SO4 and Dog Ridge) and three varieties (Thompson Seedless, Flame Seedless and Kishmish Chorni) with own roots as control in Factorial Randomized Block Design replicated four times. The observations were recorded and analysed for percent N, P, K, Ca, Na contents at bud differentiation and full bloom stages, yield attributes like fruit bud fertility, pruning weight, number of canes per vine, number of fruitful canes per vine, number of bunches per vine, bunch weight, 100 berry weight, berry diameter and yield per vine, quality attributes viz., TSS, acidity, brix-acid ratio, shelf life attributes viz., PLW, pedicel browning, berry drop, berry rot; and organoleptic evaluation.

Scions grafted to rootstocks and own roots had no significant influence on percent N content, while own rooted and scions on 1103P recorded high P content, Dog Ridge recorded high K content, SO4 recorded high Ca content while low Na content was recorded with 1103P and SO4 at both the stages of analysis. Among varieties Thompson Seedless recorded high N and P levels, while Kishmish Chorni recorded high Ca content at bud differentiation and Flame Seedless registered high Ca at full bloom. No differences among varieties were observed with regards to K content.

High vigour in terms of pruning weight was recorded with varieties grafted on rootstocks when compared to those raised on own roots. Own rooted varieties performed well compared to grafted varieties with respect to number of fruitful canes per vine and number of bunches per vine subsequently resulting in higher yield per vine. Scions on Dogridge recorded high bunch weight, 100 berry weight, berry diameter. Among the varieties Thompson Seedless was more vigorous. Kishmish Chorni recorded more number of fruitful canes, bunches per vine and high yields. Highest bunch weight and berry diameter was obtained with Flame Seedless.

High TSS and low acidity was recorded with scions on 1103 P and Dog Ridge rootstocks. Brix-acid ratio was high in scions on 1103 P. Flame Seedless and Kishmish Chorni recorded high TSS.
Scions on Dog Ridge recorded the least PLW, pedicel browning and berry drop which indicates that it has more shelf life. Among the varieties Kishmish Chorni and Thompson Seedless recorded more shelf life.

Rootstocks had not influenced fruits of scions with respect to colour and appearance. Grapes on scions of 1103 P and Dog Ridge scored highest for taste and over all acceptability. Among varieties Flame Seedless scored highest for colour and appearance. Flame Seedless and Kishmish Chorni scored highest for taste and over all acceptability.

130) "Studies on the effect of packaging on shelf life and quality of different varieties of sapota (manilkara achras (mill.) fosberg) under ambient and low temperature conditions". – L. Mythri.

ABSTRACT

Sapota (Manilkara achras (Mill.) Fosberg) is one of the important fruits of tropics. Being a climacteric fruit, it is highly perishable in nature. Due to faulty or improper handling during transportation and storage, 25-30 per cent of the produce goes waste. Hence to reduce these losses and to extend the shelf life of the fruits, a study was conducted on "Studies on the effect of packaging on shelf life and quality of different varieties of sapota (Manilkara achras (Mill.) Fosberg) under ambient and low temperature conditions" was carried out during 2011-2012 at Horticultural College and Research Institute, Dr. Y. S. R Horticultural University, Venkataramannagudem, West Godavari district of Andhra Pradesh.

An experiment was carried out to study the effect of packaging with 200 guage polyethylene bags with 1.2% ventilation on physico - chemical parameters and shelf life of fruits of different sapota varieties at ambient and low temperature storage conditions. The varieties taken are Pala, Kalipatti, PKM-1, PKM-3, Cricket Ball, Singapore, DHS-1, DHS-2, Virudhnagar and Kirthibarthi.

A set of two experiments was conducted in completely randomized factorial design and the treatments were replicated three times. Physico-chemical characters were recorded at 2 days interval at ambient condition and at 5 days interval at low temperature storage.

It was observed that the physiological loss in weight (PLW), spoilage and TSS: acid ratio showed increasing trend throughout the storage period. Total soluble solids (TSS), total sugars, reducing sugars and ethylene increased up to certain periods of ripening and thereafter decreased towards the end of shelf-life whereas the firmness, titrable acidity, ascorbic acid, phenols and pectin decreased continuously up to the end of the shelf-life.

From the above investigation, it can be concluded that among different varieties stored at ambient conditions, Kalipatti recorded higher shelf life with higher firmness, less PLW, spoilage and ethylene production without adversely affecting the quality followed by varieties Virudhnagar and PKM-3.

Similarly, under low temperature storage conditions also Kalipatti exhibited similar trend in terms of shelf life and quality of fruits followed by PKM-3 and Virudhnagar.

Therefore these three varieties Kalipatti, Virudhnagar and PKM-3 may be recommended to farmers/ traders involved in marketing sapota to distant places compared to the other varieties under study.
ABSTRACT

A set of three experiments were conducted on “Preparation and evaluation of RTS beverages from sweet orange (Citrus sinensis Osbeck) var. Sathgudi” at College of Horticulture, Rajendranagar, Ranga Reddy district. All the experiments were carried out in CRD concept with nine treatments replicated thrice in the first experiment and with five treatments replicated four times in second and with six treatments replicated four times in third experiment. Various physico-chemical parameters like TSS(ºB), Reducing sugars (%), Total sugars (%), Titrable acidity (%), pH, Ascorbic acid (mg/100g), Microbial load (cfu/ml) were analysed and organoleptic evaluation was carried out for three months with 15 day interval at ambient conditions during storage period.

The first experiment was carried out with sweet orange juice prepared with different concentrations like 10%, 14% and 18% juice with 10ºB, 15ºB and 20ºB TSS, 0.3% acidity with nine treatments and stored at ambient conditions for three months. Highest TSS, reducing sugars, total sugars, pH were recorded in 18% juice, 20ºB TSS, 0.3% acidity. A treatment with 18% juice, 15ºB TSS, 0.3% acidity recorded highest titratable acidity and ascorbic acid. The overall acceptability of the RTS with good appearance, taste, consistency, flavour and minimum microbial load was in 18% juice, 15ºB TSS, 0.3% acidity and recorded as best RTS beverage.

The second experiment was conducted with RTS beverage blends by mixing ginger juice in different proportions like 5%, 10%, 15% and 20% with sweet orange RTS (18% juice, 15ºB TSS, 0.3% acidity) of 95%, 90%, 85% and 80% respectively with five treatments and stored at ambient temperature for three months. During storage period, there was an increase in TSS, reducing sugars, total sugars, titratable acidity, Ascorbic acid and pH decreased. However, maximum acceptability with good appearance, taste, consistency, flavour, storage stability and minimum microbial load was recorded in sweet orange : ginger(80:20) blended RTS beverage and recorded as best RTS beverage blend. No microbial load was observed in ginger blended RTS beverages with 15 day interval analysis, stored at ambient conditions.

Third experiment was conducted with RTS beverage blends by mixing pomegranate juice in different proportions like 10%, 20%, 30%, 40% and 50% with sweet orange RTS (18% juice, 15ºB TSS, 0.3% acidity) beverage 90%, 80%, 70%, 60% and 50% respectively with six treatments and stored at ambient temperature for three months. During storage period, there was an increase in TSS, reducing sugars, total sugars, titratable acidity. Ascorbic acid and pH content decreased. However, maximum acceptability with good appearance, taste, consistency, flavour, storage stability and minimum microbial activity was observed in sweet orange : pomegranate (60:40) blended RTS beverage and recorded as best RTS beverage blend.

In the first experiment, 18% juice, 15ºB TSS, 0.3% acidity, in the second experiment sweet orange and ginger(80:20) blended RTS beverage and in the third experiment sweet orange and pomegranate (60:40) blended RTS beverage were recorded as best RTS beverages.
ABSTRACT

The present investigation entitled “Studies on the effect of temperature, sucrose, organic acids, biocides and packing on extension of vase life of carnation cut flowers (Dianthus caryophyllus L.) cv. Domingo” was carried out at Quality control Laboratory, ANGRAU, Rajendranagar, Hyd, during December 2011 to May 2012. The main objective of the investigation was to find out the efficacy of temperature and different preservatives like sucrose, organic acids, biocides and best of sucrose, organic acids and biocides and packaging material (polypropylene) on the post harvest vase life of cut carnation flowers. All the experiments were laid out in completely randomized design with factorial concept and replicated thrice.

A total of five experiments were conducted, from which the first experiment was conducted to evaluate the appropriate storage temperature (5°C, 10°C and at ambient temperature) and varieties (cv.Donna, cv.Domingo and cv. Keiro) for maximum vase life. Significantly lowest physiological loss in weight, highest water loss and lowest flower size and highest vase life of 25 days was recorded in carnation flowers cv Domingo stored at 5°C. As the storage temperature increased the PLW losses increased and concomitantly water loss has decreased irrespective of the variety studies. Among the varieties cv. Donna stored at ambient temperature recorded lowest vase life of 6 days. The increase in vase life at low temperature may also be due to low microbial activity at low temperatures. With respect to biochemical parameters, highest retention of chlorophyll content of leaf and calyx and lowest electrical conductivity was recorded in carnation cv Domingo stored at 5°C.

In the second experiment carnation cv Domingo was treated with various concentrations of sucrose (2, 4, 6 and 8 %) and stored at 5°C. Significantly lowest physiological loss in weight, highest water loss and lowest flower size and highest vase life of 28.66 days was recorded in carnation flowers cv Domingo treated with sucrose 4 % and stored at 5°C. Control recorded lowest vase life of 23 days. Significantly low microbial population was recorded in carnation treated with sucrose 4 %. The low PLW and high water loss concomitantly with low microbial population might be responsible for high vase life in sucrose 4 % treatment when compared with control and other treatments. In the third experiment carnation cv Domingo was treated with various concentration of organic acids (ethanol 1,2,3,4 % and acetaldehyde 1, 2, 3, 4 %) and stored at 5°C. Significantly lowest physiological loss in weight, highest water loss and lowest size of flower and highest vase life of 23.66 days was recorded in carnation flowers cv Domingo treated with ethanol 1 % and stored at 5°C. Control recorded lowest vase life of 20.33 days. Significantly low microbial population was recorded in carnation treated with ethanol 1 %.

In the fourth experiment carnation cv Domingo was treated with various concentrations of biocides (Nickel at 30, 45, 60 mg.l⁻¹, Cobalt at 50, 75,100 mg.l⁻¹ and Silicon at 100, 150, 300 mg.l⁻¹) and stored at 5°C. Significantly lowest physiological loss in weight, highest water loss and lowest flower size and highest vase life of 28.33 days was recorded in carnation flowers cv Domingo treated with Nickel at 45 mg.l⁻¹ and stored at 5°C. Control recorded lowest vase life of 23.66 days. Cobalt at 75 mg. l⁻¹ and Silicon at 150 mg. l⁻¹ were also equally effective in increase in the vase life about 28 days. Significantly low microbial population was recorded in carnation treated with Nickel at 45 mg.l⁻¹. In the fifth experiment carnation cv Domingo was treated with best of second, third and fourth experiment (Sucrose 4 %, Ethanol 1 % and Nickel at 45 mg.l⁻¹) along with polypropylene packing with ventilation (10,20,30 %)and stored at 5°C. Significantly lowest physiological loss in weight, highest water loss and lowest flower size and highest vase life of 33.66 days was recorded in carnation flowers cv Domingo treated with Nickel at 45 mg.l⁻¹ + PP 20 % and stored at 5°C. Control recorded lowest vase life of 21.66 days. Significantly low microbial population was recorded in
carnation treated with Nickel at 45 mg.l\(^{-1}\) + PP 20 %. The low PLW and high water loss concomitantly with low metabolic activity might be responsible for higher vase life in Nickel at 45 mg.l\(^{-1}\), Cobalt at 75 mg. l\(^{-1}\) and Silicon at 150 mg. l\(^{-1}\) treatments when compared with control and other treatments. Further, with respect to biochemical parameters, highest retention of chlorophyll content of leaf and calyx and lowest electrical conductivity was recorded in carnation cv Domingo treated with Nickel at 45 mg.l\(^{-1}\) + PP 20 % stored at 5\(^{\circ}\)C which has recorded highest vase life.


ABSTRACT

A set of two experiments on the effect of pomegranate cultivars (Ganesh, Bhagwa and Mridula) in combination with or without DAHP 0.1 % during fermentation of must and storage of pomegranate wine was conducted at College of Horticulture, Rajendarnagar, Dr. YSRHU, A.P. In the two experiments the design adopted is Completely Randomized Design with factorial concept with three replications per treatment. Various biochemical parameters like TSS (0 Brix), reducing sugars (%), total sugars (%), alcohols (%), titratable acidity (%), phenols (µg.ml\(^{-1}\)), TSS/acid ratio and organoleptic score were evaluated during fermentation of must and storage of wine.

In the first experiment pomegranate cv. Bhagwa, Ganesh and Mridula juice were treated with or without 0.1 % DAHP and evaluated during the fermentation of the must. Significantly highest alcohol content was recorded in pomegranate treated with 0.1 % DAHP irrespective of the pomegranate cultivar. All the cultivars of pomegranate were equally good in maintaining highest alcohol content at the end of fermentation of must. The highest alcohol content is due to the efficient and fast conversion of total sugars into alcohol when treated with 0.1 % DAHP than without DAHP. Hence, significantly lowest TSS was recorded in the pomegranate cultivars treated with 0.1 % DAHP than without 0.1 % DAHP. The phenols have significantly increased with the addition of 0.1 % DAHP than without DAHP irrespective of the cultivar. The increase in the phenols indicates efficient fermentation process with the addition of 0.1 % DAHP. Concomitantly the acidity also increased with the addition of 0.1 % DAHP irrespective of the cultivars under study.

In the second experiment pomegranate cv Bhagwa, Ganesh and Mridula juice were treated with or without 0.1 % DAHP and evaluated during storage of the wine. Significantly highest alcohol content was recorded in pomegranate cv Ganesh treated with 0.1 % DAHP. However, there was no significant difference in alcohol content with and without 0.1 % DAHP irrespective of the cultivars. The pomegranate cv Ganesh was superior in retention of highest alcohol content when compared to other cultivars. However, significantly highest total sugars and TSS were recorded in pomegranate cv Ganesh. The highest total sugars and TSS along with alcohols increased the organoleptic score of the pomegranate cv Ganesh wine.


ABSTRACT

A set of forty six genotypes of oriental pickling melon (CucumismeloL varconomon) were evaluated in a randomized block design with two replications at Vegetable research station, Rajendranagar during kharif 2012 with an objective of studying genetic variability, genetic diversity, character association and contribution.
The analysis of variance revealed significant differences for all the eighteen characters under study suggesting considerable amount of variability exists among the genotypes. The phenotypic coefficient of variation was slightly higher in magnitude than genotypic coefficient of variation for all the characters indicating that all characters had interacted with environment to some of degree. High PCV and GCV were recorded for node number of first female flower, fruit weight, placenta weight per fruit, seed cavity width, seed cavity length, number of fruits per vine, 100 seed weight and yield per vine suggesting the existence of wider genetic variability for the traits in the genotypes under study. High heritability coupled with high genetic advance as per cent of mean was observed in case of node number of first male flower, node number of first female flower, fruit weight, fruit length, fruit girth, flesh thickness, placenta weight per fruit, seed cavity width, number of fruits per vine, number of primary branches per vine, 100 seed weight and yield per vine indicating the preponderance of additive gene action making selection effective. Days to first fruit harvest, TSS and vine length showed high or medium heritability and moderate genetic advance as per cent of mean significantly the presence of both additive and non additive gene action.

The correlation study indicated that all the traits except node number of first male flower, number of days to first male flower, number of primary branches and vine length had significant positive association with fruit yield per vine at both genotypic and phenotypic levels and number of primary branches at phenotypic level.

Path coefficient analysis study revealed that 100 seed weight, placenta weight per fruit and fruit weight exerted high positive direct effect on yield per vine and these traits recorded significant positive correlation with fruit yield per vine signifying the importance of these traits in selection programme for crop improvement.

Genetic divergence was assessed among 46 genotypes of oriental pickling melon for 18 characters using Mahalanobis' $D^2$ statistics and the genotypes were grouped into seven clusters. Seed cavity length contributed maximum towards divergence followed by 100 seed weight and number of fruits per vine. Highest inter cluster distances was observed between cluster III and VI followed by cluster III and VII. Highest cluster mean values most of the traits were observed with the genotypes in cluster II.

The present investigation revealed that the genotypes IC–261077 and IC–261075, IC–261080 and IC–261078 on the basis of the characters having high heritability, high genetic advance as percent of mean and strong association and high direct effect on fruit yield were found superior and hence could be used in selection programme and as parental source for future breeding programmes.

Based on the genetic distances, cluster men values and clustering pattern the genotypes IC–261055, IC–261077, IC–261057, IC–261062, IC–261097, IC–261102 and IC–261075 from III, VI, VII and II clusters could be used best parents in crop improvement programme to produce desirable segregants in oriental pickling melon.
bottle gourd [\textit{Lagenaria siceraria} (Mol) Standl.] genotypes. Twenty three genotypes of bottle gourd along with one check variety Pusa Naveen were evaluated in RBD with three replications during spring summer of 2012 at Horticultural College and Research Institute, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among genotypes for different characters studied. Among all the genotypes studied, genotypes IC 249671 recorded the highest yield per vine and found suitable to the local agro-climatic conditions. The genotypes IC 249663, IC 249672 and check variety Pusa Naveen were also found to be elite for different characters.

Among the characters studied, high PCV and GCV were observed for characters like primary branches per vine, node at which first male flower appears, number of fruits per vine, fruit weight (g), fruit length (cm), fruit diameter (cm), yield per vine (kg), total yield (t/ha), number of seeds per fruit and 100 seed weight (g) indicating high variability available in the germplasm for these characters for further improvement.

High heritability coupled with high genetic advance as per cent of mean was observed for characters tendril length (cm), number of primary branches, days to first male flower appearance, node at first male flower appears, number of fruits per vine, fruit weight (g), fruit length (cm), fruit diameter (cm), yield per vine (kg), total yield (t/ha), number of seeds and 100 seed weight (g) indicated that these characters were least influenced by the environmental effects, and these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

The fruit yield per vine (kg) had significant positive correlation with traits like tendril length (cm), number of nodes per vine, number of primary branches per vine, total vine length (m), internodal length (cm), number of fruits per vine, fruit weight (g), fruit diameter (cm), number of seeds per fruit and 100 seed weight (g) suggesting the importance of these traits in selection for yield and can be identified as yield attributing characters for the genetic improvement of yield in bottle gourd.

The fruit yield per vine (kg) was result of direct effect of total vine length (m), number of fruits per vine, fruit weight (g). The high direct effect of these traits appeared to be the main factor for their strong association with fruit yield per vine.

Analysis for divergence using \( D^2 \) statistic revealed highly significant differences for different traits, grouping the 23 genotypes into 5 clusters. Cluster III had the maximum number of genotypes (11) followed by cluster IV (8). Maximum inter cluster distance was observed between clusters II and V while the intra cluster distance was maximum in cluster I. Highest percent contribution to divergence came from 100 seed weight (g), fruit diameter (cm), number of seeds fruit and fruit length (cm) suggested that selection of one or two elite genotypes from divergent (II & V) and (I & V) clusters based on the above characters and crossing would result in more heterosis and novel hybrids.


\textbf{ABSTRACT}

A field experiment, “\textit{Effect of planting time and plant densities on growth, yield and quality of garlic (\textit{Allium sativum} L.) Cv. Jamnagar}” was conducted at Model Orchard, College of Horticulture, Dr. Y.S.R. Horticulture University, Rajendranagar, Hyderabad during the year 2011-12. The experiment was laid in split plot design comprising two factors viz., Different planting dates and plant densities. Entire treatments were replicated three times.
The treatment combinations include four different planting dates viz., 1\textsuperscript{st} November (D\textsubscript{1}), 15\textsuperscript{th} November (D\textsubscript{2}), 1\textsuperscript{st} December (D\textsubscript{3}) and 15\textsuperscript{th} December (D\textsubscript{4}) and six plant densities viz., 10 x 5 cm (900 plants/plot) (S\textsubscript{1}), 15 x 5 cm (600 plants/plot) (S\textsubscript{2}), 20 x 5 cm (450 plants/plot) (S\textsubscript{3}), 10 x 7.5 cm (600 plants/plot) (S\textsubscript{4}), 15 x 7.5 cm (400 plants/plot) (S\textsubscript{5}) and 20 x 7.5 cm (300 plants/plot) (S\textsubscript{6}). Five plants were selected at random from each treatment and tagged for recording biometric observations. The data were recorded at an interval of 30, 60, 90, and 120 DAP for assessing parameters like per cent germination, plant height, plant girth, fresh weight of leaves, dry matter production of whole plant, leaf area, leaf area index, crop growth rate, bulb weight, bulb girth, number of cloves for bulb, yield and different quality parameters.

The results emanated from the experiment revealed that, amongst the four different planting dates, early planted crop on 1\textsuperscript{st} November (D\textsubscript{1}) recorded maximum per cent germination, plant height, plant girth, fresh weight, dry matter production, bulb weight, bulb girth, clove size, number of cloves per bulb and yield and quality parameters and minimum was observed in late planted crop on 15\textsuperscript{th} December (D\textsubscript{4}).

Amongst the plant densities, lower plant density with 20 x 7.5 cm (300 plants/plot) (S\textsubscript{6}) resulted in best performance of the all parameters except the yield. Maximum yield was recorded with higher plant density with 10 x 5 cm (900 plants/plot) (S\textsubscript{1}).

The present investigation conducted under Hyderabad conditions has revealed that planting on 1\textsuperscript{st} November with plant density of 300 plants/plot with spacing of 20 x 7.5 cm resulted maximum in all the parameters including B:C ratio (0.54:1). But maximum yield was recorded with planting on 1\textsuperscript{st} November with higher plant density of 900 plants/plot with spacing of 10 x 5 cm.

137) “Effect of polyamines, biocides and ethylene inhibitors on extension of vase life of carnation (Dianthus caryophyllus. L.) cut flower” – Shivani Sharma.

**ABSTRACT**

The present investigation entitled “Effect of polyamines, biocides and ethylene inhibitors on extension of vase life of carnation (Dianthus caryophyllus. L.) cut flower” was carried out in the Department of Floriculture and Landscape Architecture Laboratory, College of Horticulture, Rajendranagar, Hyderabad during year 2012-13.

A total set of four experiments were carried out to evaluate the effect of polyamines, biocides and ethylene inhibitors and their combination treatments on different parameters viz., water uptake, transpirational loss of water, water balance, fresh weight change, number of days for full flower opening, diameter of flower, vase life, electrical conductivity of vase solution which were recorded at an interval of 2 days during whole vase life period of carnation cut flower.

All the experiments had two factors viz., cultivars and chemicals and were laid out in a Completely Randomized Design with factorial concept and replicated thrice. In all four experiments, the flowers were continuously held in the test treatment solutions at ambient room temperature till the end of the vase life period. Vase life of cut carnations was determined by observing senescence symptoms, i.e., in-rolling of petals or wilting of one third of petals in each flower i.e., till the loss of ornamental value of flower. In experiment-IV the flowers stalks were held in the best of the holding treatment solutions of experiment I, II and III.
Among polyamine solutions, spermine 1 mM recorded best results for almost all the parameters studied and resulted in higher vase life of 13.49 days in cv. Master followed by spermidine 10 mM. The carnation cultivars treated with different biocide vase solutions, cv. Baltico recorded higher vase life of 13.75 days with aluminium sulphate 100 ppm followed by 300 ppm 8- hydroxyquinoline citrate. The ethylene inhibitor vase solutions, cv. Master recorded higher vase life of 13.16 days with benzyl adenine 15 ppm followed by benzyl adenine 20 ppm.

Whereas, among the best treatment combination vase solutions, higher vase life of 16.24 days was recorded in cv. Master with 1.0 mM spermine + 100 ppm aluminium sulphate + 15 ppm benzyl adenine followed by 1.0 mM spermine + 15 ppm benzyl adenine. Among the vase solution studied, the treatment 1.0 mM spermine + 100 ppm aluminium sulphate + 15 ppm benzyl adenine recorded higher benefit cost ratio.

138) “Morphological characterization and evaluation of spine gourd (Momordica dioica roxb.) germplasm” - Aliya Fatima.

ABSTRACT
A set of fifty female genotypes of spine gourd (Momordica dioica Roxb.) were evaluated in a randomized block design with two replications at the Vegetable Research Station, Rajendranagar during kharif, 2012 with an objective of studying their mean performance for 12 quantitative traits and 35 qualitative traits, genetic variability, genetic diversity, character association and contribution. The analysis of variance revealed significant differences for all the twelve quantitative characters viz., vine length (m), number of stems per plant, days to first female flower appearance, first female flowering node, days to first fruit harvest, days to last fruit harvest, fruiting period (days), fruit length (cm), fruit width (cm), fruit weight (g), number of fruits per plant and fruit yield (kg/plant) under study. Considerable variation was observed in spine gourd germplasm for most of the qualitative traits characterized. Of the 8 qualitative traits of fruits under study, there was considerable variation in spine strength (soft and hard), fruit color (whitish green, light green, green and dark green), fruit surface echination (densely echinate and mild-sparingly echinate), fruit shape (oblong, obovate, oval, round and top), fruit pericarp ripening (slow and sudden) and fruit blossom end rostration (faint, medium and appreciable length). On the basis of mean performance for growth, earliness, fruit attributes and quality traits, the genotypes RNK-224, RNK-197, RNK-200, RNK-196 and RNK-187 were found not only high yielding but also with acceptable fruit quality. However these horticulturally superior and high yielding genotypes thus identified are to be further evaluated in different environments over the years before commercial exploitation.

The phenotypic coefficient of variation was slightly higher in magnitude than genotypic coefficient of variation for all the characters indicating that the apparent variation is not only due to genotypes but also due to influence of environment and selection for such traits sometimes may be misleading. High phenotypic and genotypic coefficient of variation for vine length, number of stems per plant, days to first female flower appearance, first female flowering node, days to first fruit harvest, fruiting period, number of fruits per plant and fruit yield indicated the existence of wider genetic variability for these traits in the genotypes under study. High heritability coupled with high genetic advance as percent of mean for vine length, number of stems per plant, days to first female flower appearance, first female flowering node, days to first fruit harvest, days to last fruit harvest, fruiting period, fruit weight, number of
fruits per plant and fruit yield indicated that most likely the heritability is due to additive gene effects and selection may be effective. Spine gourd being highly cross pollinated crop, macro propagation through cuttings or micro propagation is found to be beneficial for the commercial exploitation of the horticulturally superior genotypes.

Genetic divergence analysis based on 12 quantitative traits following Mahalanobis’ D2 statistics revealed distinct clustering pattern, where in 50 genotypes of spine gourd were grouped into eight clusters. The characters number of fruits per plant, number of stems per plant and days to first fruit harvest were the potent factors in differentiating the germplasm of spine gourd under study. The genetically divergent clusters were cluster VI and cluster VIII. The female genotypes with high mean value from the respective clusters for the requisite characters may be used as female parent in future breeding programmes.

The correlation coefficient analysis of 12 quantitative characters revealed that fruit yield per plant had significantly positive association with vine length, number of stems per plant, days to last fruit harvest, fruiting period, fruit length, fruit width, fruit weight and number of fruits per plant, while it had significantly negative association with days to first fruit harvest. Of all the 11 quantitative traits studied for their direct and indirect effects on fruit yield per plant, direct selection is effective for number of fruits per plant, indirect selection is effective for vine length, number of stems per plant, fruit length, fruit width, fruit weight and restricted simultaneous selection is effective for days to first fruit harvest and days to last fruit harvest. The variables studied explain about 79.72% and 93.31% of the variability at phenotypic and genotypic levels, respectively in the fruit yield per plant indicating that some characters which have not been studied here need to be included in this analysis to account fully for the variation in fruit yield per plant. Number of fruits per plant is identified as major yield component in spine gourd.

139) “Effect of pruning levels and fruit load on growth, yield and fruit quality of guava (Psidium guajava L.) cv. Allahabad Safeda under high density planting”-G. Lakpathi.

ABSTRACT

Studies on “Effect of pruning levels and fruit load on growth, yield and fruit quality of guava (Psidium guajava L.) cv. Allahabad Safeda under high density planting” were carried out during the period from June, 2012 to January, 2013 at Fruit Research Station (FRS), Sangareddy, Medak district, Dr.YSRHU, A.P. with an objective of studying effect of pruning levels and fruit load on growth, yield and fruit quality of guava under high density planting. Studies were conducted on the effect of two shoot orders pruning i.e. first order shoot and second order shoot and also effect of pruning levels i.e. leaving 10 cm, 20 cm and 30 cm from base of the shoot and retaining 30, 40 and 50 fruits per tree on growth, yield and fruit quality of guava (Psidium guajava L.) cv. Allahabad Safeda with 19 treatments replicated twice in RBD with factorial concept.

Among the shoot orders studied, first order shoot pruning has beneficial effect on number of vegetative buds sprouted per pruned shoot, number of new shoots per pruned shoot, number of flower buds at leaf pair, number of flowers and fruits per new shoot, fruit diameter, average fruit weight at harvest and finally on fruit yield. Among the pruning intensities studied, 10 cm pruning intensity advanced the vegetative bud appearance, recorded maximum cumulative length of new shoots, maximum fruit diameter at harvest, average fruit weight and fruit yield. Pruning intensity of 30 cm has
increased the number of vegetative buds per pruned shoot and number new shoots per pruned shoot along with early harvesting at colour turning stage. Pruning of first order shoot with pruning intensity of 30 cm increased the number of vegetative buds sprouted per pruned shoot, more number of new shoots per pruned shoot, maximum cumulative length of new shoots, early first flower bud appearance and fruit yield.

Among the fruit load per tree studied, 30 fruit load per tree recorded the minimum number of days taken for harvesting at colour turning stage and maximum average fruit weight at harvest. However, maximum fruit yield was noticed with 50 fruit load per tree. Second order shoot pruning with 50 fruit and 30 fruit load per tree advanced harvesting at colour turning stage. Pruning intensity of 30 cm with 30 fruit load advanced the harvesting at colour turning stage but 10 cm pruning intensity with 30 fruit load per tree has recorded the maximum fruit diameter.

The treatment combination of first order shoot pruning at 30 cm intensity with 50 fruit load per tree has recorded highest fruit yield per hectare with good quality fruits. However, the quality of fruits in control and other treatments was also at par.

140) “Studies on effect of post harvest ethrel treatment and polypropylene packaging on shelf life and quality of mango cv. Suvarnarekha at different stages of maturity” – K.Sunitha Rose.

**ABSTRACT**

Mango (*Mangifera indica* L.) is considered as one of the choicest fruits of the world because of its attractive colour, delicious taste and excellent nutritional value. The interest in fruit crops has increased due to increase in exports and income potential. Especially mangoes are in increasing commercial importance all over the world. However, errors in determination of harvest maturity and post harvest handling practices are resulting in post harvest damage and consequent economic losses to farmers and exporters. Hence, post harvest management of mangoes is important in conservation and maintenance of quality of this fruit. Keeping these points in forefront, the present investigation was executed with the objectives to find out suitable harvest maturity stage, post harvest ethrel treatment and polypropylene packaging for improving the shelf life and quality of mango cv. Suvarnarekha.

The present investigation entitled “**Studies on effect of post harvest ethrel treatment and polypropylene packaging on shelf life and quality of mango cv. Suvarnarekha at different stages of maturity**” was carried out during year 2012 at Fruit Research Station, Sangareddy. A set of two experiments were carried out to evaluate the effect of post harvest ethrel treatment and polypropylene packaging on physico-chemical parameters *i.e.*, PLW, firmness, colour score, spoilage, shelf life, sugars, acids and organoleptic score at different stages of maturity, which were recorded at an interval of 3days at ambient temperature.

Among the maturity stages, mango fruits harvested at later stages of maturity recorded increase in weight loss, colour score, spoilage, sugars and decrease in firmness, titrable acidity and ascorbic acid. However, mango fruits harvested at 9-11°B TSS stage recorded better physico-chemical parameters and organoleptic score at different stages of maturity, which were recorded at an interval of 3days at ambient temperature.

With respect to studies on the post harvest ethrel treatment, ethrel at a concentration of 500 ppm recorded better fruit firmness, sugars, shelf life and organoleptic score with good flavor, texture and overall acceptability.
Among the treatment combinations, mango fruits harvested at 9-11°B TSS stage with 500ppm recorded better physico-chemical parameters and organoleptic score with higher shelf life of 6.67 days.

In experiment II, best treatment combination of experiment I was packed in polypropylene bags, retained better fruit firmness, texture, overall acceptability and lowered physiological loss in weight thereby extending the shelf life of mango as compared to control (unpacked fruits). Among the treatments, mango fruits packed in 150gauge with 1% ventilation recorded lower physiological loss in weight, higher firmness, organoleptic score with a shelf life of 9 days.

In conclusion, Mango cv. Suvarnarekha harvested at 9-11°B TSS treated with ethrel at a concentration of 500ppm and packed in polypropylene bags of 150 gauge with 1% ventilation was effective in maintaining the quality and extending the shelf life upto 9.0 days at ambient temperature.


ABSTRACT

The present investigation was undertaken to assess the per se performance, magnitude of heterosis and combining ability in bitter gourd during kharif and summer seasons of 2012-13 at Vegetable Research Station, Dr.Y.S.R Horticultural University, Rajendranagar, Hyderabad. The experiment was mainly contemplated to study heterosis, combining ability, gene action governing the inheritance, character association of the traits and find out the best general and specific combiners for higher yield.

The genotypes under the investigation comprised of five lines (RNMC-51, RNMC-52, RNMC-53, RNMC-54 and RNMC-55) which were selected on the basis of per se performance for fruit yield from Vegetable Research Station, Rajendranagar. Ten hybrids were generated and evaluated along with five parents and two commercial checks (Maya and Palee) for the fourteen characters viz., days to first pistillate flower appearance, node of first pistillate flower appearance, days to first fruit harvest, days to last fruit harvest, fruit length (cm), fruit diameter (cm), fruit flesh thickness (mm), average fruit weight (g), number of fruits per vine, fruit yield per vine (kg), number of fruits per vine, vine length (m), internodal length (cm) and number of seeds per fruit.

Combining ability analysis revealed that the ratio of GCA variance (\(\sigma^2\text{GCA}\)) to SCA variance (\(\sigma^2\text{SCA}\)) is of less than unity (<1) indicating the preponderance of non-additive gene action for all the traits except node of first pistillate flower appearance and number of fruits per vine. Since non-additive gene action was predominant for yield and yield contributing characters, it is advocated to undertake heterosisbreeding among parents for genetic improvement of these characters in bitter gourd. RNMC-55 and RNMC-52 were good general combiners and are recommended for use in breeding programmes to improve yield and yield related attributes in bitter gourd. The cross combinations RNMC-53 X RNMC-55, RNMC-52 X RNMC-55, RNMC-54 X RNMC-55 and RNMC-51 X RNMC-53 were found to be superior for fruit yield per vine.

Studies on heterosis revealed that the hybrids exhibiting high per se performance also showed high standard heterosis. The cross combination RNMC-52 X RNMC-53 registered highest negative standard heterosis for days to first pistillate flower appearance and node of first pistillate flower appearance. Significant standard heterosis for number of fruits per vine was expressed in the crosses RNMC-53 X RNMC-55, RNMC-52 X RNMC-55, RNMC-54 X RNMC-55 and RNMC-51 X RNMC-53.
On the basis of correlation and path analysis for fruit yield, it could be stated that simultaneous selection on the basis of number of fruits per vine, average fruit weight, fruit diameter, fruit flesh thickness, number of primary branches, days to last fruit harvest and vine length could help in genetic improvement of bitter gourd population.

The potential crosses like RNMC-53 X RNMC-55, RNMC-52 X RNMC-55, RNMC-54 X RNMC-55 and RNMC-51 X RNMC-53 exhibited appreciable standard heterosis and high per se performance for fruit yield per vine, which offers scope for commercial exploitation.

142) “Studies on the propagation of Karonda (Carissa carandas L.)”- Deepika.

ABSTRACT

The present investigation entitled “STUDIES ON THE PROPAGATION OF KARONDA (Carissa carandas L.)” was carried out during August 2012 – December 2012 at Agricultural Research Institute, Rajendranagar, Hyderabad. A set of two experiments were carried out to study the seed germinability and effect of sucrose and plant growth regulators on rooting of karonda cuttings in Randomized Block Design.

First experiment entitled studies on seed viability/ germinability of karonda comprised of seven treatments viz., zero days of extraction, 10 days of extraction, 20 days of extraction, 30 days of extraction, 40 days of extraction, 50 days of extraction and 60 days of extraction and replicated thrice. The karonda seeds were extracted from fruit and after shade drying seeds were kept in butter paper bags and stored at ambient temperature except first treatment where seeds are sown immediately after extraction. These stored seeds were taken for further seed germination studies.

The second experiment, effect of sucrose and growth regulators on rooting of karonda cuttings comprised of nine treatments viz., 2%, 4% sucrose, 7000, 8000 and 9000 ppm IBA, 1000, 2000 and 3000 ppm NAA and control/water dip which were replicated thrice. Treated cuttings were planted in polybags kept in shade condition and analyzed for various growth parameters.

The results on seed germinability revealed that seeds sown at zero days of extraction recorded maximum germination percentage followed by seeds sown after 10 days of extraction. Also minimum days taken for initiation of germination, days taken for 50 percent germination, days taken for completion of germination, maximum shoot length, number of leaves, root length, number of roots, fresh weight of shoot, fresh weight of root, dry weight of shoot, dry weight of root, root to shoot ratio, vigour index –I and vigour index II parameters were recorded in same treatment (T1) followed by 10 days after extraction (T2).

The increase in period of storage after extraction of seed from fruit resulted in loss of viability and vigour parameters and after 60 days of extraction (T7) only 20.33 % germination was recorded. However, seeds sown after 10 days of extraction (T2) maintained good vigour than other treatments therefore karonda seeds could be stored at ambient condition for 10 days after extraction without much variation in growth parameters.

Results of experiment on rooting of cuttings revealed that among different treatments IBA 8000 ppm recorded highest rooting percentage and lowest rooting was recorded in control.
As the successful rooting of cuttings is determined both by number of roots formed and by root elongation and growth. Therefore it is concluded that IBA 8000 ppm was best in rooting performance of karonda cuttings followed by IBA 9000 ppm and 4% sucrose compared to control.

143) “Evaluation of *rosa x hybrida* cultivars for commercial cut flower production in coastal Andhra Pradesh” – K. Janaki

**ABSTRACT**

The present experiment entitled “EVALUATION OF *Rosa x hybrida* CULTIVARS FOR COMMERCIAL CUT FLOWER PRODUCTION IN COASTAL ANDHRA PRADESH” was carried out during December 2012 to April 2013 at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district in Randomized Block Design replicated thrice. Fifteen hybrid tea rose cultivars were evaluated for growth and flower yield potential and to study the genetic variability, heritability, genetic advance, character association and path analysis for quantitative characters.

During evaluation studies significant variations were observed among fifteen cultivars for growth, flowering and yield characters. Among the cultivars maximum plant height and plant spread was observed in Cv. Maid of honor, while cultivars Gladiator, Maid of honor and Pusa mansid recorded maximum number of primary shoots. The cultivars Peggy rocke fellow, Maid of honor, Gladiator and Inksots recorded the highest number of secondary shoots per plant. Highest leaf area and leaf area index were recorded in Cv. Morcopolo whereas, maximum biomass and dry matter production was observed in Cv. Gladiator.

First flower bud appeared in all the cultivars at more or less the same time whereas, Cv. St. Patrick took maximum days from flower bud appearance to tight bud stage and Cv. Gladiator took more days from tight bud to full opening of flower. Significantly higher bud weight was recorded by Cv. Memorial day at tight bud stage whereas cultivars Gladiator and Inksots recorded significantly higher number of flower clusters per plant. The Cv. Gladiator recorded the highest flower diameter and highest number of petals per flower. The duration of flowering was found highest in Cv. Gladiator and Cv. Maid of honor. The highest total number of flowers per plant was recorded in Cv. Inksots and Cv. Peggy rocke fellow.

The Cv. Gladiator recorded the longest stem length of cut flower with maximum fresh & dry weight of cut stem, diameter of the cut stem at base, flower neck strength and flower neck length. The highest cut flower yield per plant and hectare in numbers was recorded in Cv. Gladiator and even flower yield per plant and hectare on fresh weight basis was found to be highest in Cv. Inksots and Cv. Maid of honor. The highest per cent marketable flowers were recorded in Cv. Gladiator followed by Cv. Inksots and Cv. Maid of honor. The highest per cent marketable flowers were recorded in Cv. Gladiator followed by Cv. Super star, Cv. St. Patrick and Cv. Botero.

Based on the findings of the present investigation the cultivars Gladiator, Inksorts, Peggy rocke fellow, Maid of honor, Whisper, St. Patrick and Botero can be recommended for cultivation in Coastal districts of Andhra Pradesh.

Considering all factors at a time, it could be concluded that the cultivars of rose used in this investigation had wide range of variability, particularly for cut flower yield and yield characters. As such, there is enough scope of improvement of these characters by selection. High heritability coupled with high genetic advance as per cent of mean was observed for most
of the characters indicating the predominance of additive gene action and hence direct phenotypic selection would be rewarding with respect to these traits.

Correlation and path analysis studies indicated that number of arms or productive shoots per plant, dry matter production per plant, tight bud length, total number of flowers, fresh weight of single cut flower and dry weight of single cut flower showed significant positive association and had positive direct effect on cut flower yield per plant on fresh weight basis indicating that direct selection based on these traits would be effective.

The flower yield per plant on fresh weight basis was result of direct effect of total number of flowers and fresh weight of single flower. The high direct effect of these traits appeared to be the main factor for their strong association with flower yield per plant.

144) Studies on genetic diversity for yield and quality traits in chilli (Capsicum annuum L.) – M.Janaki

ABSTRACT

An investigation was carried out during kharif 2012-13 at Horticultural Research Station, Lam, Guntur with 63 genotypes of chilli (Capsicum annuum L.) in a randomized block design with two replications to study variability, heritability, genetic advance as per cent of mean, genetic divergence, character association and the magnitude of direct and indirect effects of 15 different quantitative and qualitative traits with yield per plant.

The study revealed significant differences among genotypes for different characters studied. The genotypic coefficients of variation for all the characters studied were lesser than the phenotypic coefficients of variation indicating the masking effect of the environment. High heritability coupled with high genetic advance as per cent of mean was observed for all the characters except days to 50 per cent flowering indicating the predominance of additive gene action suggesting, direct phenotypic selection may be useful with respect to these traits.

Correlation and path analysis revealed that plant height, fruit set per cent, number of fruits per plant, number of seeds per fruit and ascorbic acid had positive significant association and positive direct effects on yield per plant indicating the use of these attributes in selection to evolve high yielding varieties of chilli.

The results of multivariate analysis indicated the presence of considerable genetic divergence among the 63 genotypes studied. The 63 genotypes were grouped into 8 clusters in both D² analysis and Ward’s minimum variance method. This analysis clearly indicated that the genetic diversity and geographical diversity were not related.

By Mahalanobis’ D² statistic, it could be inferred that fruit diameter followed by yellow carotenoids, red carotenoids, ascorbic acid and capsaicin contributed maximum towards genetic divergence.

Principal component analysis identified six principal components (PCs), which contributed 76.83 per cent of cumulative variance. The significant factors loaded in PC₁ towards maximum genetic divergence were number of seeds per fruit, total color value, ascorbic acid, number of fruits per plant, average dry fruit weight and fruit diameter. 2D and 3D graphs showed wide divergence between Warangal chapatta and LCA-724, LCA-756, LCA-353, LCA-716, Aparna which are also distantly placed with LCA-702 signifying their usefulness in chilli breeding to develop high heterotic hybrids.
Agglomerative cluster analysis revealed wide genetic distance between the genotypes of cluster VII (LCA-707, HC-28, LCA-720, KT-1 and LCA-702), cluster IV (LCA-353, LCA-716, LCA-756, LCA-724, LCA-703, Punjab Gucchedar, Pusa Sadabahar, LCA-714, Pant C-1 and LCA-710) and the cluster VIII (Warangal chapatta).

The genotypes Warangal chapatta, LCA-702, LCA-724, LCA-756, LCA-353 and LCA-716 showed maximum inter-cluster distance in Mahalanobis’ $D^2$ analysis, principal component analysis and cluster analysis and can be exploited for the development of heterotic hybrids in future breeding programmes.


**ABSTRACT**

The present study entitled “Studies on the effect of plant growth regulators on growth and yield of ashwagandha (*Withania somnifera* Dunal.)” was carried out during 2012-2013 at Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavari District, A.P.

The experiment was conducted with the growth regulators viz., Maleic Hydrazide (300 ppm, 400 ppm and 500 ppm), Cycocel (100 ppm, 150 ppm and 200 ppm) and GA$_3$ (50 ppm, 100 ppm and 150 ppm) each at three concentrations along with a control. The experiment was conducted in a randomized block design and replicated thrice.

GA$_3$ at 150 ppm has significantly increased plant height (81.53 cm), plant spread (50.76), number of branches (24.00), leaf area (1143.92), leaf area index (0.565) at all stages of crop growth starting from 60 DAS to harvest, whereas the stem girth was significantly increased by 200 ppm cycocel.

Among the yield and yield attributes, the treatment GA$_3$ at 150 ppm has significantly decreased days to 50 per cent flowering (62.33 days), days to first harvest of berries (116.00 days) and increased number of berries per plant (296.66), number of seeds per berry (41.66) and seed yield (168.18 kg ha$^{-1}$).

The treatment 150 ppm cycocel recorded maximum values for root length (26.33 cm) followed by 300 ppm MH (24.48 cm) and treatment 300 ppm MH had produced thickest roots (4.44 cm) which was on par with application of 100 ppm cycocel (4.37 cm). Fresh root weight (18.96 q ha$^{-1}$), dry root weight (8.55 q ha$^{-1}$), fresh root yield (1416.58 kg ha$^{-1}$) and dry root yield (447.30 kg ha$^{-1}$) were maximum with cycocel at 200 ppm. Whereas maximum percentage of ‘A’ grade roots (41.73 %) and ‘B’ grade roots (41.10 %) were obtained by treatment with cycocel at 150 ppm and was on par with cycocel at 200 ppm and maximum percentage of ‘C’ grade roots (41.01 %) were obtained by treatment with 50 ppm GA$_3$ which was on par with 100 ppm GA$_3$, 50 ppm GA$_3$ and control. Highest percentage of ‘low’ grade roots (28.35 %) were obtained with control.

146) “Genetic variability, heritability and path coefficient analysis in *dolichos bean (lablab purpureus l. sweet) genotypes*” – Ajay Kumar Verma.

**ABSTRACT**
A field experiment was conducted to estimate the genetic variability and genetic divergence in dolichos bean and to carry out yield component analysis through correlation and path analysis. Twelve genotypes including two checks were sown in a randomized block design with three replications, during Kharif 2012 at Horticultural College and Research Institute, Venkataramanagudem. The objective of the experiment was to identify divergent genotypes to be used as donor parents in hybridization programmes.

The analysis of variance revealed significant differences between genotypes indicating presence of sufficient amount of variability in all the characters studied. Wide range of variability was observed for plant height, days to first flowering, days to 50% flowering, number of inflorescences per plant, number of pods per inflorescence, pod yield per plant, number of pods per plant and days to last pod harvest indicating the scope for selection of suitable initial breeding material for further improvement.

On the basis of the mean performance of the genotypes among traits studied, the following were identified as promising lines for further crop improvement in dolichos bean viz., GL-243, Culture-47 and GL-671. Among all the genotypes studied, genotypes GL-243 recorded the highest pod yield per plant and found suitable to the local agro-climatic conditions.

GA as per cent of mean, GCV and PCV values were on par with one another for most of the characters which indicated that the influence of the environment on the trait(s) was very negligible. The values observed were not confounding with the environment. It is a true reflection of the homeostasis effect or buffer reaction of the gene. Thus, the true reflection of the trait is exhibited.

Among the characters studied, high PCV and GCV were observed for characters like plant height (cm), number of secondary branches per plant, number of inflorescences per plant, number of pods per inflorescence, number of pods per plant, hundred seed weight (g) and pod yield per plant (g) indicating high variability available in the germplasm for these characters for further improvement.

High heritability coupled with high genetic advance as per cent of mean was observed for characters viz., plant height (cm), number of secondary branches per plant, days to first flowering, days to 50% flowering, number of inflorescences per plant, number of pods per inflorescence, number of pods per plant, hundred seed weight (g) and pod yield per plant (g) indicating that these characters were least influenced by the environmental effects and these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

From correlation studies, it was observed that marketable pod yield per plant had exhibited highly significant positive association with number of secondary branches per plant, number of inflorescences per plant, number of pods per inflorescence, number of pods per plant, hundred seed weight (g), pod width and days to last pod harvest.

Path analysis revealed that maximum positive direct effect on marketable pod yield per plant was exhibited through number of secondary branches per plant, followed by number of pods per plant, number of inflorescences per plant, days to first pod harvest and hundred seed weight.

Present results indicate the importance of these traits in selection for marketable pod yield per plant. Direct selection based on these traits would result in simultaneous improvement of aforesaid traits and yield in dolichos bean.
By Mahalanobis’ $D^2$ statistic, it could be inferred that, marketable pod yield per ha (84.85%) followed by days to last pod harvest (9.09%), hundred seed weight (3.03%) and days to first pod harvest (3.03%) contributed maximum towards genetic divergence.

The $D^2$ analysis was carried out for 18 characters, which partitioned the twelve genotypes into four clusters. Cluster IV and I had the maximum number of genotypes (4 each) followed by cluster III (3 genotypes) and cluster II (1 genotype). Maximum divergence was observed between cluster I and III, while minimum was between cluster I and II. The maximum intra cluster distance was shown by cluster III. The clusters showing high genetic divergence could be effectively utilized in heterosis breeding programme. This suggested that selection of one or two elite genotypes from divergent clusters (I & III) based on the above characters and crossing would result in more heterosis and novel hybrids.

Therefore, it is emphasized to lay attention on the traits viz., number of inflorescences per plant, number of pos per inflorescence, number of pods per plant, pod width, days to last pod harvest, pod length, hundred seed weight and protein content in crop improvement programme of dolichos bean in future.

Three genotypes viz., GL-243, Culture-47 and GL-671 showed significantly higher yield over the checks. There is a need to evaluate these high yielding genotypes in large plots and over locations in coastal Andhra Pradesh for their commercial utilization.

147) “Effect of plant density and fertigation on productivity and quality of banana cv. Martaman” - Katakam Satya Sailaja

**ABSTRACT**

Studies were taken up to find out the influence of varying levels of nitrogen and potassium fertigation on commercial banana cv. Martaman planted at three density levels viz., $S_1$ - planting at $2 \times 2$ m spacing (2500 plants ha$^{-1}$), $S_2$ - planting at $2.5 \times 1.25$ m spacing (3200 plants ha$^{-1}$) and $S_3$ - planting at $2.5 \times 1.25 \times 1.25$ m spacing (4800 plants ha$^{-1}$). Three fertigation levels viz., supply of 100 per cent ($F_1$), 75 per cent ($F_2$) and 50 per cent ($F_3$) of the recommended nitrogen and potassium (200:200 g N and K$_2$O plant$^{-1}$) were tried with these three density levels. Observations on plant biometrical traits, bunch yield, bunch and finger attributes, soil and leaf nutrient concentration of N, P and K were recorded.

Among different plant densities, the significantly highest plant height was recorded in $S_3$ ($2.5 \times 1.25 \times 1.25$ m) during all stages of plant growth except at $3^{rd}$ MAP and it was on par with $S_2$ ($2.5 \times 1.25$ m) at $5^{th}$ MAP and $7^{th}$ MAP. The pseudostem girth was highest in the treatment $S_3$ ($2.5 \times 1.25 \times 1.25$ m) at shooting and it was on par with $S_2$ ($2.5 \times 1.25$ m). The leaf characters like number of green leaves, total leaves and leaf area was highest in the treatment $S_1$ ($2 \times 2$ m) throughout the growth period especially at $7^{th}$ MAP and shooting. Leaf Area Index was the highest in the $S_2$ ($2.5 \times 1.25$ m) during all stages of plant growth.

Among fertigation levels, the $F_1$ (100% RDF) registered significantly higher pseudostem height and girth as compared to $F_2$ (75% RDF) and $F_3$ (50% RDF) at $5^{th}$ MAP and $7^{th}$ MAP. The pseudostem height and girth was highest in the treatment $F_1$ ($100\% \text{ RDF}$) also registered the highest number of green leaves, total leaves, leaf area and leaf area index at all stages of growth except at $3^{rd}$ MAP and above treatment was on par with $F_2$ (75% RDF).

Among different plant densities, the treatment $S_1$ ($2 \times 2$ m) recorded the earliest shooting, harvest, highest bunch weight, maximum finger girth, highest number of hands per
bunch, number of fingers in 2\textsuperscript{nd} hand and highest total sugars content. Whereas the least bunch weight, finger girth, number of hands per bunch, number of fingers in 2\textsuperscript{nd} hand and total sugars content were observed in the treatment S\textsubscript{3} (2.5 \times 1.25 \times 1.25 \text{ m}). However, significantly highest per hectare yield was recorded in S\textsubscript{3} (2.5 \times 1.25 \times 1.25 \text{ m}) as compared to S\textsubscript{1} (2 \times 2 \text{ m}) and S\textsubscript{2} (2.5 \times 1.25 \text{ m}).

Among fertigation levels, the treatment F\textsubscript{1} (100% RDF) recorded earliest shooting, harvest, highest per hectare yield, bunch weight, maximum finger girth and maximum number of fingers in 2\textsuperscript{nd} hand and it was on par with F\textsubscript{2} (75% RDF) whereas the least per hectare yield, bunch weight, finger girth and number of fingers in 2\textsuperscript{nd} hand were observed in the treatment F\textsubscript{3} (50% RDF). The TSS, total sugars and shelf life were also highest in F\textsubscript{1} and F\textsubscript{2} fertigation levels.

Among different treatment combinations, S\textsubscript{1}F\textsubscript{1} produced the heaviest bunch of 20.40 Kg and it was on par with S\textsubscript{1}F\textsubscript{2} (20.33 Kg). S\textsubscript{1}F\textsubscript{1} also registered higher number of hands per bunch, more fingers, better finger attributes and it was on par with S\textsubscript{1}F\textsubscript{2}. The TSS, total sugars and reducing sugars were also highest in S\textsubscript{1}F\textsubscript{1}. The per hectare yield was enhanced for treatment combination S\textsubscript{2}F\textsubscript{1} (64.00 t/ha) and it was on par with S\textsubscript{3}F\textsubscript{2} (63.61 t/ha) while minimum per hectare yield was recorded by S\textsubscript{1}F\textsubscript{3}.

From the foregoing results of the experiment it can be concluded that, among different plant densities S\textsubscript{3} plant density (2.5 \times 1.25 \times 1.25 \text{ m} – 4800 plants/ha) registered the highest productivity (63.27 t/ha) by harnessing more sunlight under closer spacing. Similarly, among fertigation levels, F\textsubscript{1} (100% RDF – 200 g N and 200 g K\textsubscript{2}O plant\textsuperscript{-1}) applied through drip recorded the highest per hectare yield (51.03 t/ha) followed by F\textsubscript{2} (75% RDF – 150 g N and 150 g K\textsubscript{2}O plant\textsuperscript{-1}) (50.82 t/ha). Thus, the 75% RDF (F\textsubscript{2}) applied through drip was found equally productive to that of 100% RDF (F\textsubscript{1}) indicating 25% fertilizer saving.

148) “Studies on banana wine preparation by using pulp and peel with different dilutions” – Aradwad.H.D

**ABSTRACT**

An experiment entitled “studies on banana wine preparation by using pulp and peel with different dilutions” was conducted at College of Horticulture, Dr. Y.S.R. Horticulture University, Rajendranagar, Hyderabad from November 2011 to February 2012. It consisted of nine treatments where in banana only pulp and pulp & peel was diluted to 1 : 2, 1 : 3 and 1 : 4 dilutions. Each dilution was without, with 5% and 10% peel. It replicated thrice with Completely Randomized Design (CRD) with factorial concept.
The objective of experiment was to standardize the dilution of Banana pulp & with 5%, 10% peel for wine preparation, to study the effect of peel on the organoleptic evaluation fermentation and to study the compositional changes of must during fermentation and aging of wine.

The fermentation of must was completed on 15th day in 1:2, 1:3 and 1:3 dilution. The treatment 1:4 dilution with 5% peel recorded higher alcohol production (9.28%) during the fermentation.

The treatments 1:4 dilution with 5% peel recorded low of reducing sugars(1.92%), total sugars (4.85%), less of titrable acidity (0.65%) but 1:4 dilution without peel recorded minimum of phenols (238.94 µg/ml) and lower pH (3.42) during fermentation.

During aging there was decrease in alcohol content (13.48% to 13.30%) because of auto-oxidation of ethyl alcohol to aldehydes and/or combination with volatile acids to form esters. The other compositional changes like decrease of TSS, reducing sugars, total sugars, titrable acidity, phenols and tannins was noticed.

The overall acceptability of wine was recorded maximum with 1:4 dilution without peel (T7) scoring to a scale of good. On comparison of banana wine with that of standard (grape) wine, it recorded to a scale of “good” as against a scale of “excellent” for standard (grape) wine.

The calculated cost of banana wine was about Rs. 21.00 for 200ml of bottle.


ABSTRACT

The present investigation entitled “Effect of plant growth retardants and potting media on growth and quality of ornamental foliage plant aglaonema cv. Ernesto’s Favourite” was carried out at Floriculture Research Station, Rajendranagar, Hyderabad during rabi season of 2012-13. Two experiments were carried out in Completely Randomized Design.

In the first experiment, thirteen treatments were imposed as soil drench at 30 and 60 DAT with 3 replications. The treatments were T₁ (PBZ at 0.0625 mg/pot), T₂ (PBZ at 0.125 mg/pot), T₃ (PBZ at 0.1825 mg/pot), T₄ (PBZ at 0.25 mg/pot), T₅ (A-rest 0.25 mg/pot), T₆ (A-rest 0.50 mg/pot), T₇ (A-rest 0.75 mg/pot), T₈ (A-rest 1.00 mg/pot), T₉ (CCC at 500 ppm), T₁₀ (CCC at 1000 ppm), T₁₁ (CCC at 1500 ppm) and T₁₂ (CCC at 2000 ppm) and T₁₃ (Control).

Data was recorded on plant height, number of leaves, canopy length and width, leaf area and diameter of stem at 30, 60, 90, 120 and 150 days after transplanting. Data regarding chlorophyll a & b, visual plant grade, colour grade and root grade were recorded at 150 DAT.

In the second experiment, nine treatments of different potting media were used with 3 replications. The treatments were T₁ (soil + sand + FYM in 2:1:1), T₂ (soil + sand + vermicompost in 2:1:1), T₃ (soil + sand + FYM + vermicompost in 2:1:1:0.5), T₄ (cocopeat + sand + FYM in 2:1:1), T₅ (cocopeat + sand + vermicompost in 2:1:1), T₆ (cocopeat + sand +
FYM + vermicompost in 2:1:1:0.5), \( T_7 \) (sphagnum peat + sand + FYM in 2:1:1), \( T_8 \) (sphagnum peat + sand + vermicompost in 2:1:1) and \( T_9 \) (sphagnum peat + sand + FYM + vermicompost in 2:1:1:0.5).

Data was recorded on plant height, number of leaves, leaf length and width and leaf area at 30, 60, 90, 120 and 150 days after transplanting. Data regarding plant growth index, fresh and dry weight of root, visual plant grade and colour grade, root grade and N, P and K content in leaves were recorded at 150 DAT. The results were statistically analyzed in CRD. Salient features of the findings are summarized here under.

In the first experiment, at 150 DAT maximum reduction in plant height (47.53 cm), canopy length (41.25 cm), canopy width (44.63 cm) and chlorophyll-a (18.50 mg/g fresh wt) were recorded with soil drench application of paclobutrazol at 0.1825 mg/pot (\( T_3 \)) and paclobutrazol at 0.25 mg/pot (\( T_4 \)) was found to be on par. Lowest leaf area (140.66 cm²) and stem diameter (2.90 cm) were observed in paclobutrazol at 0.25 mg/pot treatment (\( T_4 \)) and was on par with paclobutrazol at 0.1825 mg/pot. Highest visual plant grade (4.57) and colour grade (4.60) were recorded with paclobutrazol at 0.1825 mg/pot (\( T_3 \)) to which paclobutrazol at 0.125 mg/pot (\( T_2 \)), paclobutrazol at 0.25 mg/pot (\( T_4 \)) and paclobutrazol at 0.0625 mg/pot (\( T_1 \)) were found on par. Highest Chlorophyll - b (6.78 mg/g fresh wt) was recorded with paclobutrazol at 0.1825 mg/pot (\( T_3 \)) which was found on par with paclobutrazol at 0.125 mg/pot (\( T_2 \)) and paclobutrazol at 0.25 mg/pot (\( T_4 \)). There was no significant difference between the treatments for the parameter of number of leaves.

In the second experiment, maximum plant height (71.36 cm), number of leaves (16.00), leaf length (60.39 cm), leaf area (208.36 cm²), plant growth index (63.37 cm), fresh weight of root (45.00 g) and N (3.46 %) and P (0.95 %) content were recorded with cocopeat + sand + vermicompost in 2:1:1 combination (\( T_5 \)) at 150 DAT. Maximum leaf width (10.13 cm), dry weight of root (8.53 g), visual plant grade (4.50), colour grade (4.58), root grade (4.45) and K content (1.91 %) were recorded with cocopeat + sand + vermicompost in 2:1:1 combination \( (T_5) \) and cocopeat + sand + FYM + vermicompost in 2:1:1:0.5 proportion \( (T_6) \) was found on par.

Highest growth reduction and improved quality of aglaonema cv. Ernesto’s Favourite due to paclobutrazol might be attributed to retarding gibberellin synthesis and increasing chlorophyll content respectively. Superior performance of cocopeat + sand + vermicompost (2:1:1) media might be due to high water holding capacity, better aeration, high cation exchange capacity, acceptable pH and low EC.

150) “Heterosis and combining ability for yield and its components in Okra [Abelmoschus esculentus (L.) moench]” - Shashi Kumar.

**ABSTRACT**

Current cultivars of okra (Abelmoschus esculentus (L.) Moench) are of low productivity and sub-optimal fruit quality with susceptibility to yellow vein mosaic virus (YVMV). The development and release of advanced varieties with high productivity potential, resistance to YVMV and superior fruit quality is the engine of market demand. In view of the above, the present investigation was carried out to study the heterotic patterns, combining ability effects and genetic system governing yield and yield associated traits so as to identify the promising \( F_1 \) hybrids for commercial exploitation. Six nearly homozygous, optimally divergent, horticulturally superior and YVMV resistant lines of okra (RNOYR-14, RNOYR-15, RNOYR-16, RNOYR-17, RNOYR-18 and RNOYR-24) selected from the genetic stocks available at the Vegetable Research Station, Dr. Y. S. R. Horticultural University (Dr. YSRHU), Rajendranagar, were crossed in half-diallel fashion during kharif 2012, resulting in the development of 15 one-way single cross \( F_1 \) hybrids.
A set of twenty four entries involving fifteen F₁ hybrids along with their six parental lines and three standard checks ['No. 64' (Mahyco), ‘Avantika’ (Bioseed) and ‘Shakti’ (Nunhems)] were evaluated by raising each entry in a double-row plot of 3.0 m length and 0.60 m width at a spacing of 60×30 cm in a randomized block design with three replications at the Experimental Farm, Vegetable Research Station, Rajendranagar during summer 2013 for seventeen biometric characters viz., plant height (cm), number of branches per plant, internodal length (cm), days to fifty per cent flowering, first flowering node, first fruiting node, fruit length (cm), fruit width (cm), fruit weight (g), total number of fruits per plant, number of marketable fruits per plant, total yield per plant (g), marketable yield per plant (g), fruit and shoot borer infestation (FSB) on fruits and shoots (%) and yellow vein mosaic virus infestation on fruits and plants (%).

Analysis of variance revealed that there were significant differences (P<0.05) among twenty four entries for almost all the biometric traits except days to 50 per cent flowering and FSB infestation on fruits indicating that these variations may be due to environmental influences on the genotypes as well as differences in the genetic potential of the F₁ hybrids, their parental lines and standard checks. On the basis of mean or per se performance, three crosses RNOYR-15×RNOYR-16, RNOYR-16×RNOYR-17 and RNOYR-17×RNOYR-18 were of significantly higher yield potential than the standard check ‘No. 64’, but of comparable yield potential with other checks ‘Avantika’ and ‘Shakti’. In addition, these three crosses were also of superior pod quality and resistance to YVMV.

Correlation and path coefficient analyses revealed that total number of fruits per plant and total yield per plant not only had positively significant association with marketable pod yield per plant, but also had positively high direct effect on marketable pod yield per plant and are regarded as the main determinants of marketable pod yield per plant and direct selection through these traits will be effective. The genotypic correlation coefficient of plant height, number of branches per plant, internodal length, fruit length, fruit weight and number of marketable fruits per plant with marketable yield per plant was significantly positive, but their direct effects on marketable yield per plant was negative or negligible suggesting that the indirect casual factors are to be considered simultaneously for selection. Total number of fruits per plant and total yield per plant had strong influence on marketable pod yield per plant and are the main determiners of marketable pod yield per plant.

Analysis of variance for combining ability revealed significance of mean squares for general combining ability (gca) and specific combining ability (sca) indicating that both additive and non-additive components of heritable variance are involved in the inheritance of majority of the traits except fruit length and weight for which only non-additive variance is involved. Combining ability analysis following Griffing’s method-II and model-1 revealed that the ratio of gca variance (σ²gca) to sca variance (σ²sca) of less than unity (<1) indicating the preponderance of non-additive gene action involved in the inheritance of all the traits under study. Since non-additive gene action was predominant for yield and yield contributing traits, it is advocated to undertake hybridization programme among the promising parents for genetic improvement of these characters in okra.

Combining ability analysis revealed that the parental line RNOYR-16 being the high general combiner for plant height, number of branches per plant, first flowering and fruiting node, total number and number of marketable fruits per plant, total and marketable yield per plant, FSB infestation on shoots along with resistance to YVMV and superior fruit quality is recommended for use in breeding programmes to improve yield in okra. The high specific combining crosses RNOYR-15×RNOYR-16 and RNOYR-16×RNOYR-17 whose one of the parents had significantly high gca effect, could be utilized in recombination breeding with the
selection of superior plants in passing generations to evolve true breeding lines or varieties with higher total and marketable yield per plant.

Heterosis analysis revealed distinct and useful heterotic patterns mainly in terms of yield and its components in few crosses over their mid and better parents and standard checks. The crosses RNOYR-17×RNOYR-18, RNOYR-15×RNOYR-16 and RNOYR-16×RNOYR-17 were the top three heterotic hybrids, manifesting significantly positive average heterosis of 82.23, 79.21 and 64.42%, respectively and heterobeliosis of 71.43, 65.84 and 54.71%, respectively for marketable yield per plant. Of the top three crosses RNOYR-15×RNOYR-16, RNOYR-16×RNOYR-17 and RNOYR-17×RNOYR-18 identified on the basis of mean performance for pod yield, quality and YVMV resistance, the cross RNOYR-15×RNOYR-16 manifesting significant standard heterosis of 20.57% over check ‘No. 64’ for marketable yield per plant was the topmost heterotic hybrid, while the other two crosses RNOYR-16×RNOYR-17 and RNOYR-17×RNOYR-18 exhibiting positively non-significant standard heterosis for marketable yield per plant over all the three checks were as comparable as those of standard checks under study. Hence, the promising F₁ hybrids RNOYR-15×RNOYR-16, RNOYR-16×RNOYR-17 and RNOYR-17×RNOYR-18 with high yield potential, good fruit quality, YVMV resistance, highly positive and significant sca effect have got the potential of being commercially exploited for the production of F₁ hybrids in okra after further multi-environment testing.

151)“Effect of organic manures on growth, root yield and quality of carrot (Daucus carota L.)” Gudimalla Sandeep Kumar

ABSTRACT

A field experiment was conducted during rabi, 2012 to study the “Effect of organic manures on growth, root yield and quality of Carrot (Daucus carota L.)” at college farm, College of Horticulture, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad, Andhra Pradesh. The experiment was laid out in randomized block design with three replicated treatments viz., T1: Groundnut cake (100%), T2: Neem cake (100%), T3: Vermicompost (100%), T4: Groundnut cake (75%) + Neem cake (25%), T5: Groundnut cake (75%) + Vermicompost (25%), T6: Groundnut cake (50%) + Neem cake (50%), T7: Groundnut cake (50%) + Vermicompost (50%), T8: Groundnut cake (50%) + Neem cake (25%) + Vermicompost (25%), T9: Neem cake (75%) + Groundnut cake (25%), T10: Neem cake (75%) + Vermicompost (25%), T11: Neem cake (50%) + Vermicompost (50%), T12: Neem cake (50%) + Groundnut cake (25%) + Vermicompost (25%), T13: Vermicompost (75%) + Groundnut cake (25%), T14: Vermicompost (75%) + Neem cake (25%), and T16: RDF.

The data were recorded on plant height (cm), root length (cm), root diameter (cm), fresh and dry weight of root (g plant⁻¹), root to shoot ratio, total root yield (t ha⁻¹), carotene content (mg 100g⁻¹), TSS (°Brix), reducing sugars (%), non-reducing sugars (%), total sugars (%), storage life (days), NPK uptake (kg ha⁻¹) by the crop, available NPK (Kg ha⁻¹) and microbial count in the soil (CFU g soil⁻¹).

The highest plant height and root diameter were recorded with groundnut cake (75%) + vermicompost (25%) followed by groundnut cake (50%) + neem cake (50%) which was at par. The root length was maximum with neem cake (75%) + groundnut cake (25%) followed by groundnut cake (50%) + neem cake (50%). Groundnut cake (50%) + neem cake (50%)
recorded significantly higher values for fresh and dry root weights, root yield, NPK uptake, available NPK and microbial activity in the soil. Whereas neem cake (75%) in combination with vermicompost (25%) recorded maximum values for carotene content, TSS, reducing, non-reducing and total sugars. However, the higher net returns and BCR were obtained with vermicompost (100%).

The results of the present investigation demonstrated that among different organic manures tried, Groundnut cake (50%) + Neem cake (50%) can be considered as the best treatment for obtaining higher growth and root yield in carrot. Better quality was obtained with neem cake (75%) + vermicompost (25%). Under organic cultivation of carrot, for obtaining maximum net returns, vermicompost (100%) may be used as an organic source of nutrients.

152) “Effect of cutting management and sulphur application on growth, yield and quality of fenugreek (Trigonella foenumgraecum L.)”- Kandagatla Sandeep.

ABSTRACT

A field experiment, “Effect of cutting management and sulphur application on growth, yield and quality of fenugreek (Trigonella foenumgraecum L.)” was conducted at Vegetable Research Station, Rajendranagar, Hyderabad during Rabi 2012-2013 (September-January). The experiment was laid out in Randomized Block Design with factorial concept comprising 16 treatments and replicated thrice. The treatment consisted of cuttings as one factor containing four cutting treatments viz., No cutting (C0), Single cutting at 30 days after sowing (C1), Single cutting at 60 days after sowing (C2) and Double cuttings at 30 and 60 days after sowing (C3). Comprising Sulphur level was taken as another factor which consisted of four different sulphur treatments No sulphur application (S0), 20kg sulphur per hectare (S1), 40 kg sulphur per hectare (S2) and 60 kg sulphur per hectare (S3). Five plants were selected at random from each treatment and tagged for recording biometric observations. The data were recorded at an interval of 30, 60 and 90 DAS for assessing parameters like days taken for germination, plant height (cm), number of branches per plant, root length (cm), number of root nodules per plant, dry matter production, number of days taken for first flowering, number of days taken for 50 per cent flowering, number of flowers per plant, pod setting per cent, number of pods per plant, number of seeds per pod, test weight, pod length, herbage yield, seed yield, seed protein content, seed protein yield, sulphur content in seed.

The results emanated from the experiment recorded significantly maximum plant height, root length, number of nodules per plant, early in flowering, early 50 per cent flowering, early maturity, maximum test weight and maximum seed protein content were reported in no cutting treatment (C0). Single cutting at 30 DAS (C1) recorded significantly maximum number of branches, number of flowers, number of pods, pod length, number of seeds per pod, seed yield, protein yield and sulphur content in seed. Where as all the parameters were recorded to be significantly minimum was observed with Double cutting at 30 and 60 days after sowing (C3). Maximum Fresh weight, dry matter production and herbage yield observed with double cutting at 30 and 60 days after sowing (C3). Among the sulphur levels 60 kg sulphur per hectare (S3) resulted in best performance of the all parameters like plant height, root length, number of nodules per plant, number of flowers per plant, number of pods per plant, number of seeds per pod, test weight, pod length, herbage yield, seed yield, seed protein content, seed protein yield and sulphur content in seed. Among the interaction between cutting management and sulphur application, the treatment of no cutting with 60 kg
sulphur per hectare (C0S3) resulted in maximum plant height and number of nodules. Maximum number of branches, yield attributes like number of pods, pod length, number of seeds per pod, test weight, seed yield, herbage yield, quality attributes protein content in seed, protein yield, sulphur content in seed with single cutting at 30 DAS and sulphur 60 kg per hectare (C1S3). In study of economics of the experiment, increase in dose of sulphur along with one cutting at 30 DAS (C1S3) maximum B: C ratio (1.58).

ABSTRACT

The experiment was taken up to elicit the information on effect of integrated nutrient management on growth, seed yield and quality parameters of fenugreek (Trigonella foenum-graecum L.) cv. Lam Methi-2 to predict the best nutrient combination. Experiment was carried out during rabi of 2012-2013 at Horticultural College & Research Institute, Venkataramannagudem, West Godavari district of Andhra Pradesh. The studies were carried out with 12 different INM treatments involving combinations of 100% recommended dose of fertilizers, 75% and 50% doses of inorganic fertilizers along with organic manures viz., farm yard manure, vermicompost, poultry manure, neem cake and biofertilizers (Rhizobium + PSB).

The experiment was laid out in a randomized block design (RBD) with three replications and data on the effect of different INM treatments on growth, dry matter production, yield, yield attributes, quality, nutrient uptake, residual fertility and economics of cultivation were recorded and statistically analyzed.

The application of 50% RDF through inorganic fertilizer and 50% through organic source (neem cake) along with Rhizobium and PSB inoculation (T11) had resulted in maximum plant height, more branches, maximum plant spread, highest dry matter production at all growth stages and also recorded minimum days for 50% flowering, first pod formation, 50% pod formation and more number of pods plant-1.

The highest yield per hectare and yield attributes like pod length (cm), more number of seeds per pod, highest grain filling and grain shelling percentage, test weight of seed, seed yield and harvest index were recorded with 50% RDF through inorganic source and 50% through organic source (Poultry manure) along with biofertilizers Rhizobium + PSB (T9).

The quality attributes viz., germination percentage, speed of germination were found non significant irrespective of the INM treatments. Whereas, significantly maximum seedling length, highest seedling vigour index, maximum seedling dry weight and highest protein content of seed were recorded with the application of 50% RDF through inorganic source and 50% through organic source (poultry manure) along with biofertilizers Rhizobium + PSB (T9).

The highest nutrient uptake and residual fertility status of available nitrogen, phosphorous and potassium were recorded with the application of 50% RDF through inorganic source and 50% through organic source (poultry manure) along with biofertilizers Rhizobium + PSB (T9).

The different INM treatments were observed to profoundly influence the gross and net returns in addition to benefit : cost ratio of fenugreek cultivation. The treatment 50% RDF through inorganic source and 50% through organic source (poultry manure) along with biofertilizers Rhizobium + PSB (T9) resulted in the highest benefit cost ratio of 1:1.51 followed by 1:1.35 in the combination of 75% RDF through inorganic source and 25% through organic source (poultry manure) along with biofertilizers Rhizobium + PSB (T8).
ABSTRACT

The present experiment entitled “Effect of auxins and type of cutting on propagation of phalsa (Grewia subinaequalis DC.) under open and shadenet conditions” was carried out during 2012-2013 at Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The present experiment was designed to study the effect of auxins i.e., IBA and NAA each at the rate of 100 ppm, 200 ppm and 300 ppm concentrations and type of cutting namely hardwood cutting and semi hardwood cutting with seven treatments and three replications in Mixed Factorial Randomized Block Design under open and shadenet condition on root and shoot parameters and establishment in the main field.

Of all the auxin concentrations used, IBA at 200 ppm concentration recorded high value of minimum number of days (14.40 and 10.48) to sprouting, maximum percentage of rooted cuttings (33.17 and 43.12), number of roots per rooted cutting (28.50 and 31.00), length of the longest root per rooted cutting (16.39 cm and 20.00 cm), survival percentage of rooted cuttings (20.10 and 34.00), fresh weight of the root (2.46 g and 3.69 g) in both the conditions. For number of sprouts per cutting (2.26, 4.34 and 4.85; 3.35, 4.26 and 4.90) number of leaves per cutting (3.51, 4.90 and 5.28; 3.98, 5.03 and 6.97) leaf area per cutting (4.39 cm$^2$, 7.62 cm$^2$ and 13.58 cm$^2$; 5.82 cm$^2$, 9.20 cm$^2$ and 13.75 cm$^2$) of 30, 45 and 60 days after planting in the poly bag respectively. The leaf chlorophyll content per cutting (37.52 mg and 40.93 mg), fresh weight of the shoot (18.45 g and 25.36 g), dry weight of the shoot (8.49 g and 9.91 g) and percentage of establishment of rooted cuttings in the main field (17.91 and 27.33) those raised under both open and shadenet conditions respectively.

Between the type of cutting, hardwood cutting recorded highest for minimum number of days to sprouting (16.44 and 13.32) and recorded maximum percentage of rooted cuttings (32.00 and 42.85), number of roots per rooted cutting (20.02 and 24.54), length of the longest root per rooted cutting (13.74 cm and 19.20 cm), survival percentage of rooted cuttings (18.74 and 28.93), fresh (1.99 g and 2.69 g) and dry weight of the root (0.58 g and 0.77 g) in both the conditions. For number of sprouts (1.99, 3.77 and 4.11; 2.86, 3.93 and 4.21) per cutting, number of leaves(3.17, 4.45 and 4.84; 3.50, 4.72 and 6.20) per cutting, leaf area (3.74 cm$^2$, 6.45 cm$^2$ and 11.44 cm$^2$; 4.81 cm$^2$, 7.58 cm$^2$ and 12.38 cm$^2$) per cutting at 30, 45 and 60 days after planting in the poly bag respectively. The leaf chlorophyll content per cutting (30.63 mg and 35.32 mg), fresh weight of the shoot (15.47 g and 20.05 g) and dry weight of the shoot (8.04 g and 9.87 g) and percentage of establishment of rooted cuttings in the main field (14.96 and 24.66) those raised under both open and shadenet conditions respectively.

Among the treatment combinations, hardwood cuttings treated with IBA at 200 ppm concentration recorded high value for minimum number of days to sprouting (12.48 and 9.34) and recorded maximum percentage of rooted cuttings (45.68 and 60.00), number of roots (38.00 and 42.00) per rooted cutting, length of the longest root per rooted cutting (20.89 cm and 26.08 cm), survival percentage of rooted cuttings(28.21 and 50.00), fresh (3.10 g and 3.69 g) and dry weight of the root (0.94 g and 1.08 g) in both the conditions. For number of sprouts per cutting (2.53, 4.95 and 5.70; 3.50, 5.00 and 5.30), number of leaves per cutting (3.86, 5.70 and 6.13; 4.16, 5.90 and 8.50) leaf area per cutting (4.33 cm$^2$, 7.04 cm$^2$ and 15.61cm$^2$; 6.70 cm$^2$, 9.83 cm$^2$ and 15.72 cm$^2$) at 30, 45 and 60 days after planting in the poly bag respectively. The leaf chlorophyll content (44.96 mg and 49.78 mg) per cutting fresh (22.07 g and 25.36 g)
and dry weight of the shoot (11.24 g and 12.82 g) and percentage of establishment of rooted cuttings in the main field (25.21 and 45.00) those raised under both open and shadernet conditions respectively.

The hardwood cuttings treated with IBA at 200 ppm concentration followed by NAA 100 ppm concentration and raised under shadernet condition are the best treatments for root and shoot parameters, percentage of rooted cuttings and survival percentage of phalsa for the propagation and for its commercial multiplication.

155) “Genetic divergence studies in cassava (Manihot esculenta Crantz)” – B.Babu Rao.

**ABSTRACT**

The experiment was taken up to elicit the information on magnitude of genetic variability, heritability and to predict the gains realized through selection, character association, cause and effect relationship and divergence for the quantitative characters in cassava (Manihot esculenta Crantz) genotypes. Eighteen genotypes of cassava were evaluated in RBD with three replications during kharif season of 2012 at Horticultural College and Research Institute, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among genotypes for different characters studied. Among all the genotypes studied, genotype PDP accession-10 recorded the highest tuber yield per hectare and found suitable to the local agro-climatic conditions. The genotypes H-165 and Sree Padmanabha (MNga-1) were also found to be elite for different characters.

Among the characters studied, high PCV and GCV were observed for characters like number of leaves per plant, total leaf area, height of first branching and HCN content indicating high variability available in the germplasm for these characters for further improvement.

High heritability coupled with high genetic advance as per cent of mean was observed for characters number of leaves per plant, total leaf area, height of first branching, stem diameter, tuber dry matter content, starch content, HCN content and tuber yield per hectare, which indicated that these characters were least influenced by the environmental effects, and these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

The tuber yield per hectare (t/ha) had significant positive correlation with traits like petiole length, number of leaves per plant, total leaf area, stem diameter, tuber diameter, plant dry matter content, starch content and HCN content suggesting the importance of these traits in selection for yield and can be identified as yield attributing characters for the genetic improvement of yield in cassava.

The tuber yield per hectare (t/ha) was result of direct effect of number of leaves per plant, stem diameter, number of tubers per plant, tuber diameter and plant dry matter content. The high direct effect of these traits appeared to be the main factor for their strong association with tuber yield per hectare.

Analysis for divergence using $D^2$ statistic revealed highly significant differences for different traits, grouping the 18 genotypes into 5 clusters. Cluster IV had the maximum number of genotypes (7) followed by cluster I (5). Maximum inter cluster distance was observed between clusters IV and V while the intra cluster distance was maximum in cluster IV. The highest per cent contribution to divergence came from tuber dry matter content, plant dry matter content, height of first branching, starch content, number of leaves per plant and stem diameter, which suggested that selection of one or two elite genotypes from divergent (IV & V)
and (II & V) clusters based on the above characters and crossing would result in more heterosis and novel hybrids.


**ABSTRACT**

An investigation entitled “Effect of Pre-harvest foliar sprays, packaging and storage temperatures on growth, yield and storability of African marigold (*Tagetes erecta* L.) Cv. Pusa Narangi Gainda” was conducted under two experiments at Floricultural Research Station, Rajendranagar, Hyderabad during *Rabi*, 2012-2013. The first experiment was laid out in RBD to study the effect of different pre-harvest foliar sprays viz., GA3 (50, 100 and 150 ppm), Salicylic acid (100, 150 and 200 ppm), Ca (NO3)2 (0.5, 1 and 2%), CaCl2 (0.5, 1 and 2%) along with the control (water spray) on growth, yield, quality, shelf life and xanthophyll content of marigold flowers. Pre-harvest foliar application of 150 ppm of GA3 has enhanced the plant height, number of branches per plant, inter nodal length, and reduced the days taken for first bud appearance. It also increased the receptacle length of flower, flower diameter, number of flowers per plant, flower yields/plant. On the other hand, pre-harvest application of salicylic acid (SA) at 200 ppm resulted in maximum fresh weight of flowers. Pre-harvest sprays of salicylic acid (200ppm) was found to be the best treatment next to GA3 as it increased flower diameter, number of flowers per plant, flower yield and storage life of marigold flowers under ambient conditions. Further, application of Ca(NO3)2 and CaCl2 at 2% has resulted in maximum moisture content in petals, increased flower yields and also recorded maximum shelf life under ambient conditions. Pre-harvest foliar sprays had no significant influence on the xanthophyll content of the petals. In second experiment, three best treatments from experiment-I were selected on the basis of flower quality and storage life to study the effect of packaging on storage life of flowers at ambient and cold storage (100C). The three best treatments viz., SA at 200 ppm, Ca (NO3)2 at 2% and CaCl2 at 2% along with control were packaged in five packaging materials viz., onion mesh bags and polyethylene bags with 0%, 1%, 2% & 3% ventilation and were stored at ambient conditions, and at 100C. Observations were recorded on physiological loss in weight (PLW) relative water content (RWC) storage life, xanthophyll content and marketability of flowers.

Among all the treatments, the loose flowers of marigold from the pre-harvest spray CaNO3 (2% ) packaged in 200 gauge polyethylene bags with 0% ventilation has recorded the minimum physiological loss in weight (PLW), relative water content (RWC) and maximum percentage of marketable flowers. The storage life of flowers was also extended by 2 days under ambient conditions and by 7days in cold storage (100C) when compared to control. The flowers without any pre-harvest sprays stored in onion mesh bags and 200 gauge polyethylene bags with 3% ventilation recorded maximum PLW, RWC and minimum storage life and marketable flowers.

Among the two storage temperatures, the storage of the flowers at 100C has significantly slowed down the PLW and wilting of the flowers and increased the storage life of the flowers by almost 10 days when compared to the flowers stored at ambient conditions.

ABSTRACT

The present investigation entitled “Studies on the effect of pretreatments, time and method of propagation in mango (Mangifera indica L.) cv. Baneshan” was carried out from June 2012 to February 2013 at Fruit Research Station, Sangareddy, Medak. Two experiments were carried out in Factorial Randomized Block Design with appropriate replications.

In the first experiment, pretreatments and storage of scion wood was done for sixteen treatments with 3 replications and propagated through different methods. The treatments were T₁ (precured scion + 0 days storage + veneer grafting), T₂ (un precured scion + 0 days storage + veneer grafting), T₃ (precured scion + 3 days storage + veneer grafting), T₄ (un precured scion + 3 days storage + veneer grafting), T₅ (precured scion + 5 days storage + veneer grafting), T₆ (un precured scion + 5 days storage + veneer grafting), T₇ (precured scion + 7 days storage + veneer grafting), T₈ (un precured scion + 7 days storage + T-budding), T₉ (precured scion + 0 days storage + T-budding), T₁₀ (un precured scion + 0 days storage + T-budding), T₁₁ (precured scion + 3 days storage + T-budding), T₁₂ (un precured scion + 3 days storage + T-budding), T₁₃ (precured scion + 5 days storage + T-budding), T₁₄ (un precured scion + 5 days storage + T-budding), T₁₅ (precured scion + 7 days storage + T-budding), T₁₆ (un precured scion + 7 days storage + T-budding). In the second experiment, effect of season was studied on sixteen treatments with 3 replications. The treatments were T₁ (veneer grafting at 1st fortnight of August), T₂ (veneer grafting at 2nd fortnight of August), T₃ (veneer grafting at 1st fortnight of September), T₄ (veneer grafting at 2nd fortnight of September), T₅ (veneer grafting at 1st fortnight of October), T₆ (veneer grafting at 2nd fortnight of October), T₇ (veneer grafting at 1st fortnight of November), T₈ (veneer grafting at 2nd fortnight of November), T₉ (T-budding at 1st fortnight of August), T₁₀ (T-budding at 2nd fortnight of August), T₁₁ (T-budding at 1st fortnight of September), T₁₂ (T-budding at 2nd fortnight of September), T₁₃ (T-budding at 1st fortnight of October), T₁₄ (T-budding at 2nd fortnight of October), T₁₅ (T-budding at 1st fortnight of November) and T₁₆ (T-budding at 2nd fortnight of November).

Data was recorded on bud take (%), days taken for bud break where as data on number of flushes, length of new scion shoot (cm), diameter of new scion shoot (cm), number of new leaves per shoot, internodal length of new shoot (cm), number of new laterals, length of new laterals (cm) was recorded at 15 days interval from 30 days after grafting up to a period of 105 days. In both experiments, among the propagation methods, only veneer grafting showed success where as complete failure was observed in T-budding under southern Telangana conditions of Andhra Pradesh.

In the first experiment, among the scion wood studied, precured scion wood defoliated for ten days before veneer grafting recorded mean minimum number of days taken for bud break (14.33), mean maximum new scion length (5.45 cm), diameter (0.47 cm), internodal length (2.28 cm), number of flushes (1.50), number of leaves (9.39) and mean maximum number of new laterals (1.31) and length of new laterals (2.46 cm) which was significantly superior to non precured scions. Among different periods of storage of mango scion wood, storage for 3 days recorded mean minimum number of days taken for bud break (14.11), mean maximum new scion length (5.19 cm), diameter (0.44 cm), internodal length (2.20 cm), number of flushes (1.45), number of leaves (9.23) and maximum number of new laterals (1.27) and length of new laterals (2.40 cm) which was significantly superior to 0 days storage, 5 days and 7 days storage.
The interaction between pretreatments and storage intervals of scion wood revealed that precured scion stored for 3 days has recorded minimum number of days taken for bud break (12.13), maximum new scion length (6.13 cm), diameter (0.53 cm), internodal length (2.77 cm), number of flushes (1.71), number of leaves (10.16) and maximum number of laterals (1.47) and length of laterals (2.75 cm) which was significantly superior to 0 days storage, 5 days and 7 days storage. In the second experiment, regarding season effect, September month followed by August month recorded minimum number of days for bud break (13.23), maximum new scion length (6.20 cm), diameter (0.58 cm), internodal length (3.50 cm), number of flushes (2.23), number of leaves (10.10) and maximum number of new laterals (1.45) and length of new laterals (3.14 cm) which was significantly superior to November and December months. Among different methods of propagation tried, it is concluded that T-budding is a complete failure in mango and can be successfully propagated through veneer grafting by using defoliated scion which is stored for 3 days and grafted during September followed by August month under Southern Telangana region of Andhra Pradesh.


ABSTRACT

The present study entitled "Effect of organic manures and bio-fertilizers on growth, yield and fruit quality of banana cv. Grand Naine (AAA)" was carried out during 2011-2012 at Horticultural Research Station, Kovvur, West Godavari district of Andhra Pradesh. The effects of certain organic manures (vermicompost, farmyard manure, poultry manure, ash and neem cake) and biofertilizers (Azospirillum, T. harzianum, arbuscular mycorrhizal fungi and phosphate solubilizing bacteria) on growth, yield and fruit quality of banana cv. Grand Naine were studied. The combination of organic sources were compared with T₁₁ (200 g N+ 50 g P+ 200 g K) and control (N₀ + P₀ + K₀). An attempt was made to evaluate a combination of organic manures and biofertilizers for their influence on growth, yield and fruit quality of banana cv. Grand Naine.

In the present investigation, application of 100% RDF has shown significant effect on vegetative growth viz., plant height, plant girth, functional leaves at shooting, leaf area, phyllocron, root growth characters. Among organic treatments, T₄ (FYM+ VC+ NC+ Ash) has exerted greater influence on vegetative growth like plant height, plant girth, functional leaves at shooting, leaf area, phyllocron and was observed with maximum number of total leaves at shooting. Whereas, root growth was more in treatment applied with T₀ (FYM + NC + VC + Ash + T₁₂ + Triple green manuring with sunhemp + cowpea + cowpea as intercrop + AMF, Azospirillum, PSB and T. harzianum).

Higher nitrogen, phosphorous and potassium levels in the index leaf were observed with application of inorganic fertilizer. However, organic treatment T₄ has registered maximum concentration for N and K among organic treatments. Treatment T₁₀ (PM+NC) has recorded higher concentration of phosphorous in index leaf among organic treatments.

Shooting was earlier in conventionally grown plants (242.53 days) and also days to harvest (98.51 days) was earlier in plants treated with inorganic fertilizers. Organically grown plants took about 270 to 297 days to shooting and 101 to 106 days to harvest. Application of T₄ (FYM+ VC+ NC+ Ash) recorded shorter duration for shooting and days to harvest among the organic treatments.
Conventionally grown plants registered highest bunch yields, bunch weight, hands bunch\(^{-1}\), fruits in second hand, fruit length, fruit girth. Whereas, among organic treatments application of T\(_4\) (FYM+ VC+ NC+ Ash) registered higher fruit yield, maximum bunch weight, hands bunch\(^{-1}\), fruits in second hand, fruit length and fruit girth.

Application of T\(_4\) (FYM+ VC+ NC+ Ash) has recorded higher TSS content and a longer shelf life in the fruits, lowest acidity and acid to sugar ratio, maximum reducing sugars and non reducing sugars, peel thickness. In organoleptic evaluation, T\(_4\) (FYM+ VC+ NC+ Ash) has registered higher ratings for appearance, taste, flavor, overall acceptability of fruits.

Available nutrient status after harvest for nitrogen, phosphorous, potassium was highest in the treatment, 100% RDF. Among organic treatments, T\(_4\) (FYM+ VC+ NC+ Ash) has recorded maximum available N and K in the soil after harvest. T\(_9\) has recorded maximum available P content in soil after harvest among organic treatments. Organic treatments application has improved organic carbon content in soil by the end of banana crop. Among the treatments, T\(_9\) has recorded higher organic carbon content (0.84 %). Highest benefit cost ratio (2.46) was recorded for organic banana, grown with application of T\(_4\) (FYM+ VC+ NC+ Ash) followed by T\(_6\) and T\(_10\) (2.45).

Among various treatments applied with combinations of organic manures and biofertilizers, combination of organic manures with farmyard manure (15 kg), vermicompost (7.5 kg), neem cake (1.875 kg) and ash (9.94 kg plant\(^{-1}\)) was found to be promising for organic banana production under coastal ecosystem of Andhra Pradesh.

159) “Studies on IBA and NAA induced rhizogenesis in propagation of pomegranate (Punica granatum L.) cultivars under open conditions” – P.Swathi.

**ABSTRACT**

The experiment was undertaken to elicit the genetic variation of cultivars with respect to rooting and shooting parameters and to observe the changes in biochemical constituents periodically during rhizogenesis in pomegranate when treated with IBA and NAA each at 2000 ppm and 4000 ppm concentrations. Two cultivars of pomegranate were evaluated in Factorial Randomised Block Design with three replications during August to December of 2012 at Horticultural College and Research Institute, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among cultivars for different parameters studied. Among the two cultivars studied, cv. Bhagwa performed superior in almost all parameters except average number of roots, number of leaves and leaf area which were highest in cv. Ganesh. This result showed that cv. Bahgwa was found to be elite for different characters studied during propagation.

Of all the concentrations of plant growth regulators used, IBA at a concentration of 4000 ppm recorded minimum number of days for sprouting, maximum rooting and shooting parameters \(\text{viz., percentage of rooted cuttings, survival percentage of rooted cuttings, average number of roots, length of longest root, fresh and dry weights of roots, fresh and dry weights of shoots at 90 DAP; average number of shoots per cutting, number of leaves per cutting, length of longest shoot at 30 DAP, 60 DAP and 90 DAP. The percentage of establishment of rooted cuttings in the main field was also recorded maximum with the same treatment. The performance of the cuttings treated with NAA 2000 ppm was inferior.}
The treatment combinations exhibited a significant difference with respect to the observations studied. The cuttings of Bhagwa treated with 4000 ppm IBA recorded significantly superior results in rooting and shooting parameters than any other interactions. The least performance was observed to be found in the cuttings of cv. Ganesh treated with NAA 2000 ppm for most of the rooting and shooting parameters, whereas, mean number of roots, fresh weight of roots, number of leaves and leaf area were found to be minimum in Bhagwa cuttings treated with NAA 2000 ppm.

The nutritional status of cuttings and biochemical changes taken place during rooting process were significantly effected by treatments imposed on cuttings. The biochemical constituents viz., starch, total sugars, carbohydrates and proteins increased upto 30 DAP which declined afterwards upto 90 DAP indicating their utilization in formation of root primordia and development of roots. The phenols showed a positive relationship with rooting which increased throughout the rooting period.

It was found that IBA was more effective than NAA. Bhagwa cuttings treated with IBA 4000 ppm gave pronounced effect on root formation indicating its eliteness for propagation in pomegranate under open conditions.

“Standardization Of Techniques For Induction Of Tetraploidy In Watermelon (Citrullus lanatus Thunb.)” – T. Vardhini Kumari.

ABSTRACT

The present experiment entitled “STANDARDIZATION OF TECHNIQUES FOR INDUCTION OF TETRAPLOIDY IN WATERMELON (Citrullus lanatus Thunb.)” was carried out during rabi and summer seasons of 2012 - 2013 at the experimental plots of Division of Vegetable Crops, Indian Institute of Horticultural Research [IIHR], Bangalore in Factorial Randomized Block Design with three replications. Four diploid varieties of watermelon (Arka Manik, Arka Muthu, Sugar Baby, IIHR-14) were used for inducing tetraploidy by treating the meristem of the cotyledon seedlings with different concentrations of colchicine solution (0.2%, 0.3% and 0.4%) by using PEG (0.5%) and without PEG.

Tetraploid and diploid plants were identified by screening methods such as chloroplast number in the guard cells of stomata and stomatal density per microscopic area. Number of chloroplasts in guard cells was ranged from 5-7 in diploids and 12-14 in tetraploids, and the stomatal density per microscopic area was high in diploids compared to tetraploids.

Response for induction of tetraploidy was varied among the four genetic back grounds when treated with different treatment combinations. Maximum percentage of tetraploids were induced in the variety Arka Muthu (14.16%) and among the various treatments highest number of tetraploids were obtained from the plants treated with 0.2% of colchicine solution. The tetraploidy percentage 10.62 % in the variety Sugar Baby, 10.90 % in Arka Manik and 9.76 % in IIHR-14. The best treatment for induction of tetraploidy for the variety Sugar Baby was 0.4% colchicine + PEG ,where as 0.3% colchicine + PEG was found to be the best for the variety Arka Manik and 0.4% colchicine concentration was best for the variety IIHR-14.

Significant differences were observed in the number of stomata in tetraploids and maximum number of stomata per microscopic area was observed in the variety IIHR-14 followed by Arka Manik , Arka Muthu and Sugar Baby .
The identified tetraploids were evaluated for agronomic traits such as leaf area, flower and seed characteristics. Highest leaf area, days to male and female flower opening was observed in the tetraploids when compared to diploids. Tetraploid seeds were large in size with partial filled seed cavity at chalazal end. In M₁ generation significant differences were observed for seed yield, seed length, seed width, seed index between tetraploids and diploids in all the varieties. Among the tetraploids, maximum number of seeds were recorded in the variety Sugar Baby followed by Arka Muthu and IIHR-14. Maximum seed length, seed width and seed index was observed in the variety Arka Muthu, followed by IIHR-14 and Sugar Baby.

Leaf area was higher in tetraploids compared to diploids. Maximum leaf area was noticed in the variety IIHR-14 followed by Sugar Baby and Arka Muthu. Variation in number of days to first male flower appearance and days to first female flower appearance was found among the varieties. Arka Muthu has taken maximum days for first male and female flower appearance followed by Sugar Baby and IIHR-14.

Based on the above findings variety Arka Muthu responded well for induction of tetraploidy at 0.2 % colchicine, where as as 0.4 % + PEG was found to be best treatment for the variety Sugar Baby, 0.3 % + PEG for the variety Arka Manik and 0.4 % colchicine was best for IIHR-14.


**ABSTRACT**

A survey was conducted in 38 orchards growing sapota cv. Pala in West Godavari district of Andhra Pradesh for developing leaf nutrient norms through Diagnosis and Recommendation Integrated System (DRIS) for nutrient management. Soil and leaf samples were collected during October, 2012. The collected samples were processed and analyzed for macro- and micronutrient status and a data bank was established. The entire population was divided into two sub-groups, namely, low and high yielding orchards taking a dividing line of 300 kg tree⁻¹. In all, 15 orchards were identified as high yielders and 23 orchards were identified as low yielders to derive the DRIS norms.

The mean N, P, K, Ca, Mg, S, Cu, Mn, Fe and Zn contents in low yielding population were 0.96 %, 0.16 %, 0.23 %, 2.02 %, 0.23 %, 0.21 %, 115.96 ppm, 140.85 ppm, 279.56 ppm and 79.22 ppm respectively compared with 1.07 %, 0.25 %, 0.24 %, 2.90 %, 0.26 %, 0.26 %, 130.30 ppm, 142.69 ppm, 281.57 ppm and 86.76 ppm of respective nutrients of high yielding population.

Forty-five nutrient expressions having highest variance ratio were chosen as diagnostic norms from high yielding population. The nutrient ratio expressions were N/P (12.759), N/K (4.565), N/Ca (0.384), Mg/N (0.476), S/N (0.400), N/Cu (0.009), N/Mn (0.008), N/Fe (0.004), N x Zn (64.743), K/P (2.862), Ca/P (31.837), P/Mg (1.059), S/P (3.084), P/Cu (0.002), Mn/P (1735.001), Fe/P (3491.733), Zn/P (585.842), K/Ca (0.085), K/Mg (1.144), K x S (0.060), K/Cu (0.002), Mn/K (608.769), K/Fe (0.001), K/Zn (0.005), Mg/Ca (0.094), S/Ca (0.096), Ca/Cu (0.024), Mn/Ca (51.826), Fe/Ca (102.835), Zn/Ca (25.388), Mg x S (0.065), Mg/Cu (0.002), Mn/Mg (694.419), Fe/Mg (1393.502), Zn/Mg (302.227), S/Cu (0.002), S x Mn (36.502), S x Fe (72.979), S x Zn (17.159), Mn/Cu (1.126), Fe/Cu (2.224), Zn/Cu (0.508), Fe/Mn (1.988), Mn/Zn (3.117) and Fe/Zn (6.233).
Diagnosis of nutrient imbalance through DRIS indices showed that among macro nutrients, P was recorded as most yield limiting nutrient in 31.58 % of the orchards followed by Mg (18.42 %). Among micronutrients Cu and Zn recorded as most yield limiting nutrients in 13.16 % of orchards. The nutrient nitrogen was second most required nutrient in 21.05 % orchards followed by zinc (18.42 %) and copper (15.79 %). The nutrients phosphorous and calcium were least required in 23.68 % orchards followed by nitrogen and zinc in 15.79 % orchards. P was the most common yield limiting nutrient followed by N in low yielding orchards, Mg in high yielding orchards among macro nutrients and, Cu and Zn among micro nutrients.

The nutritional balance index (NBI) indicated an overall imbalance of nutrients based on sum of the indices, irrespective of sign. In addition, five nutrient ranges/standards were derived using mean and standard deviation as deficient, low, optimum, high and excess for each nutrient, to serve as a guide for diagnostics. The optimum leaf nutrient ranges for N, P, K, Ca, Mg, S, Cu, Mn, Fe and Zn were 0.29 to 1.71 %, 0.13 to 0.41 %, 0.23 to 0.24 %, 1.23 to 3.50 %, 0.10 to 0.39 %, 0.09 to 0.37 %, 80.49 to 162.75 ppm, 111.12 to 174.17 ppm, 254.85 to 305.86 ppm and 17.61 to 130.99 ppm respectively.

162)“Evaluation of brinjal (Solanum melongena L.) germplasm for elite accessions”- G. Madhavi.

ABSTRACT

A study was carried out to know variability, heritability, genetic gain, character association and direction of relationship between highly heritable characters, genetic divergence and reaction to shoot and fruit borer and wilt in brinjal (Solanum melongena L.) genotypes. Forty seven genotypes were evaluated in RBD with two replications using the variety Gulabi as check during kharif, 2012 at Horticultural Research Station, Venkataramannagudem, Dr. Y. S. R. Horticultural University, West Godavari district, Andhra Pradesh.

The study revealed significant differences among genotypes for different characters studied. Among all the genotypes studied, genotype IC261772 recorded the highest yield per ha. The genotypes IC261772 (Yield per plant and yield per ha), IC099676 (Fruit weight), IC112991 (Fruit length), IC354135 (Resistance to shoot and fruit borer), IC090785 (Fruit length) and IC285140 (Fruit length and Yield per plant) were found to be elite for different characters.

Characters like number of flowers per inflorescence, number of fruits per cluster, per cent fruit set in medium, short and pseudo short styled flowers, number of fruits per plant, fruit diameter (cm), fruit girth (cm), fruit length (cm), fruit weight (g), calyx length (cm), fruit yield per plant (kg), yield per ha (t/ha), per cent shoots and fruits infested with shoot and fruit borer and per cent plants infected with wilt recorded high magnitude of PCV and GCV revealing the presence of distinct genetic variation among the accessions under study and hence greater scope for improvement through selection.

High heritability combined with high genetic advance as per cent of mean was observed for all traits under study except for days to final picking and number of harvests. Hence, these characters can be fixed by simple selection procedures like pure line selection, mass selection as additive genes play a major role in inheritance of these characters and there is wide scope for improvement through breeding methods like hybridization etc.
Number of flowers per inflorescence, number of fruits per cluster and number of fruits per plant associated positively and significantly at both genotypic and phenotypic levels with fruit yield per plant denoting the importance of these characters as yield attributing traits which are reliable for improvement through selection.

Plant spread (cm), per cent fruit set in long styled flowers, number of fruits per plant, fruit girth (cm), fruit length (cm), calyx length (cm), days to first picking, total number of harvests, per cent fruits infested with shoot and fruit borer exerted high positive direct effect on fruit yield per plant (kg). Direct selection of these characters would be effective in genetic improvement of brinjal.

Analysis for divergence using $D^2$ statistic revealed highly significant differences for different traits, grouping the 48 genotypes into 7 clusters. Maximum inter cluster $D^2$ values were noticed between clusters I and VII, followed by clusters IV and VII indicating the presence of distinct genetic divergence while maximum intra cluster distance was recorded in cluster VI. Fruit weight (g), days to final picking and number of fruits per plant were chief contributors towards total divergence denoting the role of these characters in selection of parents from distinct clusters for hybridization programme. Selection of parents from clusters I and VII provide high chance of feasible cross combinations for producing new recombinants.

Evaluation for shoot and fruit borer incidence revealed that five genotypes viz., IC285140, IC354135, IC421194, IC545893 and local check variety Gulabi showed moderate resistance to shoot and fruit borer suggesting their utilization in further breeding programmes especially for resistance breeding. Eleven genotypes showed tolerance to shoot and fruit borer.

163) “Standardization of pruning and propagation technique in arabian jasmine (Jasminum sambac)” - R.Poorna Chaitanya.

**ABSTRACT**

The present experiment entitled “STANDARDIZATION OF PRUNING AND PROPAGATION TECHNIQUE IN ARABIAN JASMIN (Jasminum sambac)” was carried out during November 2012 to June 2013 at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district of A.P. The present investigation was taken up in three experiments *i.e.*, i) Effect of pruning date and intensity of pruning on growth and flowering of Jasminum sambac genotypes. 
ii) Effect of defoliating chemicals (chemical defoliation) on growth and flower yield of Jasminum sambac. 
iii) Effect of auxin concentration and number of nodes on rooting and per cent establishment of Jasminum sambac cv. “Double Mogra”.

The experiment (i) was laid out in split plot design replicated thrice with 36 treatment combinations, comprising of three genotypes (main treatments) viz., Nityamalli (T₁), Tuppamalli (T₂) and Starmalli (T₃) at three different pruning dates (sub treatments) viz., pruning in November $10^{th}$ of 2012 (ST₁), December $10^{th}$ of 2012 (ST₂), January $10^{th}$ of 2013 (ST₃) and four levels of pruning heights(sub - sub treatments) viz., 25 cm from ground level (SST₁), 50 cm from ground level (SST₂), 75 cm from ground level (SST₃) and un pruned bushes (SST₄). The experiment (ii) was laid out in Randomized Block Design replicated thrice with 16 treatment combinations Three genotypes or local varieties of Jasminum sambac Nityamalli (T₁), Tuppamalli (T₂) and Starmalli (T₃) with 16 chemical concentrations viz., manual defoliation, paraquat dichloride (500ppm, 1000ppm, 1500ppm, 2000ppm and 2500ppm), sodium chloride (1000ppm, 2000 ppm, 3000 ppm and 4000 ppm), potassium nitrate (1 %, 2 %, 3 %, 4 % and 5 %) and control (water spray). The experiment (iii) was laid out in Factorial
Randomized Block Design replicated thrice with 16 treatments viz., Factor 1: number of nodes $T_1$: 1$^{st}$ node, $T_2$: 2$^{nd}$ node, $T_3$: 3$^{rd}$ node and $T_4$: 4$^{th}$ node. Factor 2: chemical concentrations (IBA) $C_1$: 1000 ppm, $C_2$: 2000 ppm, $C_3$: 3000 ppm and $C_4$: control.

Among the genotypes, Nityamalli pruned in December’12 at 50 cm height from ground level has exhibited the highest the number of laterals per primary shoot, productive shoots per plant, leaves per primary shoot, leaf area per shoot, number of petals per flower, flower bud diameter, weight of flower buds/plant (g), weight of flower bud/m$^2$ plot (kg) and weight of flower bud/hectare (tonnes). Whereas the trait, days to flower bud development was recorded minimum in Nityamalli pruned in January’13 at 75 cm height from ground level. The duration of flowering was more in Nityamalli pruned in November’12 at 50 cm height from ground level.

The traits viz., longer primary shoot length, shoot thickness and weight of 50 flower buds were found to be elite in Tuppamalli pruned in December’12 at 50 cm height from ground level. Maximum flower bud length was recorded in Tuppamalli pruned in January’13 at 25 cm height from ground level. Characters viz., inter nodal length and days to first flower bud initiation after pruning was recorded minimum in Starmalli pruned in January’13 at 75 cm height from ground level. Among all the interaction treatments, Nityamalli pruned in December’12 at 50 cm height from ground level was found to be elite for maximum characters.

In experiment (ii) the traits viz., weight of defoliated leaves and total arial biomass per plant was recorded high in Tuppamalli sprayed with 1000 ppm Paraquat dichloride. The days taken for complete defoliation was recorded minimum in the genotype Starmalli sprayed with 2500 ppm paraquat dichloride. The days taken for new leaf emergence after chemical defoliation was recorded minimum in the genotype Nityamalli sprayed with 2000 ppm paraquat dichloride. The highest flower yield per plant was obtained in the genotype Nityamalli sprayed with 1000ppm Paraquat dichloride. Hence, the treatment Paraquat dichloride @1000ppm would be recommended to the farmers.

In experiment (iii) the 3$^{rd}$ node cuttings treated with IBA @ 2000 ppm exhibited significant increase in rooting percentage, root length, root number, root fresh weight, maximum sprout diameter, fresh and dry weight of rooted cuttings. The traits viz., number of days taken for sprouting and propagation cycle was recorded minimum in 3$^{rd}$ node cuttings treated with IBA @ 2000 ppm. Whereas 4$^{th}$ node cutting treated with 2000 ppm of IBA and 3$^{rd}$ node cutting treated with 3000 ppm of IBA has obtained more number of sprouts and maximum number of leaves per cutting. Among all the treatment combinations, 3$^{rd}$ node cutting treated with IBA @ 2000 ppm has shown best results regarding maximum traits.

164) “Seedling vigour studies in cashewnut (Anacardium occidentale L.)” – Prashikhan Reang.

**ABSTRACT**

A study was conducted on “SEEDLING VIGOUR STUDIES IN CASHEWNUT (Anacardium occidentale L.)” during October 2012 to April 2013 at College of Horticulture, Rajendranagar, Hyderabad. The study was conducted under two experiments namely the “Effect of pre-sowing seednut treatments on germination and seedling vigour of cashewnut under different environments” and “Effect of bio-fertilizers treatment on germination and seedling vigour of cashewnut under different environments.” Both the experiments were laid out in Completely Randomized Block Design with factorial concept under open and mist condition. Poly bags of 25 x 15 cm are used with potting mixture of 1:2:1 ratio of red soil, well rotted FYM and fine sand. The recommended package of nursery practices was followed in maintaining the experiments.
In the present study, pre-sowing treatment of cashewnut seed for 48 hrs water soaking + 100 ppm GA 3 (C 7 ) proved to be superior with regard to all the germination and seedling vigour characters studied during the experiment period. In bio-fertilizers study, best treatment from 1st experiment (C 7 ) + VAM (C 6 ) proved to be superior with regard to all the germination and seedling vigour characters studied during the experiment period.

The results of the present investigation revealed that among the different traits, the maximum seedling height, number of leaves, internodal length, seedling girth, dry matter percentage of shoot to root ratio was recorded with the seed treatment of 48 hrs water soaking + 100 ppm GA 3 (C 7 ) . Similarly minimum days for germination, maximum rate of germination and germination percentage were recorded with seed treatment of 48 hrs water soaking + 100 ppm GA 3 (C 7 ). However maximum dry matter percentage of root was recorded with 48 hrs water soaking + 100 ppm IBA treatment (C 9 ).

In bio-fertilizers study minimum days for germination, maximum rate of germination and percentage of germination and maximum number of leaves, internodal length, seedling height, seedling girth, dry matter percentage of shoot, dry matter percentage of root and shoot to root ratio was recorded with best treatment from 1st experiment (C 7 ) + VAM (C 6 ).

Between the conditions studied, seedling under mist house recorded superior with regard to all the germination and seedling vigour characters as compared to the seedling under open condition.

Among the varietal studies BPP-8 (V 2 ) found to be superior with regard to all the germination and seedling vigour characters studied during the experiment period.

Among the different interaction studies in experiment-I, condition x varieties, the combination of mist condition with variety BPP-8 (A 1 V 2 ); among condition x treatments, the combination of mist condition with 48 hrs water soaking + 100 ppm GA 3 (A 1 C 7 ); among the varieties x treatments, BPP-8 with 48 hrs water soaking + 100 ppm GA 3 (V 2 C 7 ); among the three interaction studies mist condition x variety, BPP-8 with 48 hrs water soaking +100 ppm GA 3 (A 1 V 2 C 7 ); proved to be superior with regard to all the germination and seedling vigour characters studied during the experiment period.

Among the different interaction studies in experiment-II, condition x varieties, the combination of mist condition with variety BPP-8 (A 1 V 2 ); among condition x treatments, the combination of mist condition with best treatment from 1st experiment (C 7 ) + VAM (A 1 C 6 ); among the varieties x treatments, BPP-8 with best treatment from 1st experiment (C 7 ) + VAM (V 2 C 6 ); among the three interaction studies mist condition x variety, BPP-8 with best treatment from 1st experiment (C 7 ) + VAM (A 1 V 2 C 6 ); proved to be superior with regard to all the germination and seedling vigour characters studied during the experiment period.


ABSTRACT

An experiment was conducted to study the effect of time of grafting and propagation structures on success of veneer grafting in mango (Mangifera indica L.) cv. Banganpalli under
southern zone of Andhra Pradesh during the period from July, 2012 - April, 2013. Time of grafting was taken on 15th of every month from July to January. Whereas the effect of propagation structures viz., open condition, 50% shade net, 75% shade net, naturally ventilated polyhouse and partial shade under coconut trees on success of veneer grafting was studied at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. district of Andhra Pradesh.

A comprehensive study of results revealed that grafts prepared on 15th July were found to take minimum time (11.09 days) for sprouting and recorded maximum percentage (81.11%) of sprouted grafts, higher number of leaves (19.55), maximum leaf area (398.26 cm²) and also in respect of sprout growth (6.34 cm), height of graft (18.67 cm), number of nodes on scion (22.08) and number of growth flushes (1.96) per graft closely followed by the grafts prepared on 15th August and 15th January. However, minimum graft diameter (1.02 cm) was recorded by the grafting on 15th August. Among propagation structures the highest graft survival (67.18%) was recorded under naturally ventilated polyhouse which supported greater vigour of scion sprouts as evident from the data obtained on number of growth flushes (1.77) followed by open condition (1.75) and shade net 50% (1.74). Naturally ventilated polyhouse recorded maximum number of nodes (22.61) which was significantly superior over all other shade conditions. It has double advantage of earliest sprouting of more number of grafts and survival till the end of study period. Among the interactions, grafts prepared in the month of July under naturally ventilated polyhouse were found to record the highest survival percentage (88.25 %) followed by those under shade net 50% (85.44 %). The next superior values were found to be recorded by the grafts prepared during August under naturally ventilated polyhouse with survival percentage (85.55 %) followed by the grafts preparing during January under the same conditions (80.90 %).

It can be concluded from the present study that the warm conditions and growing temperatures in the months July under naturally ventilated polyhouse and shade net 50% followed by the grafts prepared during August and January under naturally ventilated polyhouse conditions found to favour survival percentage of veneer grafts in mango cv. Banganpalli under Anantharajupeta conditions.

166) Evaluation of capsicum (Capsicum annuum L.var. grossum Sendt.) varieties and hybrids for yield and quality traits under shade net.- G.Narayana Swamy.

**ABSTRACT**

A study was conducted to evaluate different capsicum (Capsicum annuum L.var. grossum Sendt.) varieties and hybrids for growth, reproductive, yield and quality traits under 50 % shade net during the period from September, 2012-March, 2013 at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. district of Andhra Pradesh.

The experiment was laid out in RBD with three replications and eight treatments (4 varieties and 4 hybrids) viz., T1-Arka Basant, T2-Arka Gaurav, T3-Arka Mohini, T4-Royal Wonder, T5-Angel, T6-Indra, T7-Inspiration and T8-NS-280 under 50 % green shade net house of 250 m². The spacing adopted was 45 cm × 30 cm. The results on growth parameters revealed that maximum plant height (130.17 cm and 126.63 cm) and more number of leaves plant-1 (121.00 and 117.48) at 120 DAT were observed in the hybrid, Indra and in the variety, Arka Basant, respectively. The number of primary and
secondary branches plant-1 were more in the hybrid, Indra (5.93 and 5.34) and in the variety, Royal Wonder (2.85 and 2.55), respectively.

The data on reproductive parameters indicated that number of days taken for flower initiation was significantly lower in the hybrid, Indra (36.28 days) and in the variety, Royal Wonder (36.87 days) which is an indication of earliness. In addition to earliness to flowering, the variety, Royal Wonder and the hybrid, Indra were identified as early maturing types as they took least number of days for 50 % plants to flower (40.66 and 41.00). Time taken for first fruit picking was observed least in the hybrid, Indra (76.14 days) and in the variety, Royal Wonder (78.29 days). The hybrid, Indra and the variety, Royal Wonder produced maximum number of flowers plant-1 (39.28 and 35.57, respectively).

With regard to fruit characteristics, higher fruit length (10.42 cm and 8.97 cm), fruit width (8.03 cm and 7.98 cm), fruit volume (313.36 cc and 310.66 cc), fruit wall thickness (1.05 cm and 0.98 cm) and number of locules per fruit (4.00 and 3.87) were recorded in the hybrids, Indra and NS-280, respectively. The hybrid, Inspiration showed maximum pedicel length (5.53 cm), whereas the hybrid, Angel recorded maximum inner fruit diameter (6.83 cm). The hybrid, NS-280 and the variety, Royal Wonder contained more number of seeds per fruit (201.00 and 188.33) and highest dry seed weight per fruit (1.42 g and 1.18 g), respectively. Thousand dry seed weight was more in the hybrid, NS-280 (7.10 g) and in the variety, Arka Mohini (6.70 g).

The hybrids, Indra and NS-280 produced maximum number of fruits plant-1 (17.00 and 16.39) and fruits m-2 (74.80 and 72.11), respectively. Higher values of fruit length, fruit width and fruit wall thickness contributed for maximum mean fruit weight in the hybrids, Indra (124.70 g) and NS-280 (115.31 g). The hybrids, Indra (2.12 kg, 9.40 kg, 23.48 q and 37.52 t) and NS-280 (1.89 kg, 8.39 kg, 20.97 q and 33.56 t) were found to be superior over other varieties and hybrids in terms of yield plant-1, yield m-2, yield 250 m-2 and yield acre-1, respectively. In respect of fruit quality traits, the varieties viz., Arka Basant and Royal Wonder and the hybrids viz., Angel and Indra showed maximum capsaicin content (0.010%) as compared to other varieties and hybrids. Total carotenoid content was high in the hybrid, NS-280 (0.178%) and in the variety, Arka Basant (0.139 %). The hybrid, Angel (179.34 mg g-1) recorded high ascorbic acid content followed by the variety, Arka Gaurav (170.85 mg g-1). High TSS was recorded in the variety, Arka Gaurav (8.37 °Brix) and in the hybrid, Angel (7.53°Brix).

The performance of capsicum varieties and hybrids in terms of cost economics revealed that the hybrids, Indra and NS-280 gave more net returns (Rs.57,526 and Rs.56,860) and high B:C ratio (2.13 and 2.10), respectively when grown under 50% shade net of 250 m2. The outcome of the present investigation clearly indicates that the capsicum hybrids viz., Indra and NS-280 were best performers interms of yield and net returns under 50% shade net environment.

167) “Studies on performance of certain taro (Colocasia esculenta (L.) Schott) cultivars for growth, yield and quality parameters”- S.Sailaja

ABSTRACT

The present investigation “Studies on performance of certain taro (Colocasia esculenta (L.) Schott) cultivars for growth, yield and quality parameters” was conducted at Horticulture College and Research Institute, Anantharajupet, Rly. Kodur, Kadapa district,
Andhra Pradesh to assess the performance of sixteen taro cultivars in terms of growth, yield and quality parameters during kharif, 2012. The experiment was laid out in Randomized Block Design and replicated thrice. All the plant growth characters were taken at 150 days after planting (DAP), yield and its attributes were recorded at harvest. Significant differences were observed among the cultivars in terms of all the growth characters (except leaf length: width ratio), yield and its attributes and quality parameters. Plant height was maximum in IG Collection-8 (96.23 cm) and minimum was recorded in IG Collection-4 (58.03 cm). Plant spread in E-W and N-S direction was varied from 71.00 cm (cv. KCS-2) to 45.07 cm (cv. IG Collection-4) and 66.20 cm (cv. IG Collection-8) to 42.60 cm (cv. IG Collection-4) respectively. While maximum number of suckers (7.27) and leaves (15.47) plant-1 was observed in IG Collection-6. KCS-3 recorded highest pseudostem girth (14.63 cm) and IG Collection-4 (11.13 cm) recorded lowest girth. Maximum leaf lamina length (42.97 cm), width (33.93 cm), petiole length (75.97 cm) and petiole width (6.30 cm) were recorded by cultivar CA-21, while minimum in cv. Kasibugga. Out of sixteen taro cultivars, three were short duration, twelve were medium duration and one was a long duration cultivar. Number of corms and cormels plant-1 was varied from 1.00 (cv. IG Collection-1) to 1.53 (cv. CA-49) and 24.47 (cv. IG Collection-4) to 47.34 (cv. CA-49) respectively. Maximum corm length and girth was recorded by CA-21 (6.77 cm) and IG Collection-6 (17.21 cm), while maximum cormel length and girth was recorded by IG Collection-6 (5.67 cm) and IG Collection-1 (8.70 cm). Single corm weight was higher in KCS-3 (99.84 g) and lower in CA-49 (65.09 g), whereas single cormel weight was higher (15.68 g) in IG Collection-6 and lower (9.19 g) in Satamukhi. Corm yield plant-1 varied from 75.04 g (cv. CA-43) to 101.00 g (cv. IG Collection-8), cormel yield plant-1 varied from 373.00 g (cv. IG Collection-4) to 568.67 g (cv. CA-21) and total yield plant-1 varied from 0.45 kg (cv. IG Collection-4) to 0.66 kg (cv. CA-21). Higher corm yield ha-1 (41.73 q ha-1) was recorded by IG Collection-6, while higher cormel yield ha-1 (225.06 q ha-1) was recorded by CA-21 followed by CA-49 and IG Collection-8. Higher total corm and cormel yield ha-1 (262.10 q ha-1) was recorded by the cultivar CA-21 followed by CA-49, IG Collection-8 and KCS-3. Dry matter content of corm and cormel has varied from 20.17% (IG Collection-1) to 24.66% (KCS-2) and 19.99% (IG Collection-1) to 22.71% (IG Collection-6) respectively.

Starch content in the cormel was higher (58.20%) in IG Collection-6 and lowest in CA-43 (45.09%), whereas protein content was maximum (7.20%) in IG Collection-7 and minimum (4.35%) in NDA-1. The oxalate content in the cormel was varied from 0.36%-0.55% and lowest oxalate content was observed in NDA-1, Satamukhi and KCS-3. Brown leaf spot disease incidence was less in cultivars CA-21 (18.88%), KCS-2 (21.10%), IG Collection-8 (23.32%), CA-43 (23.32%), and KCS-3 (24.43%). Spodoptera infestation was less observed in IG Collection-1, Satamukhi, IG Collection-4, CA-49, KCS-2 and BCC-17. Cultivar CA-21 has shown higher benefit cost ratio (2.65) followed by CA-49 (2.46), KCS-3 (2.38) and IG Collection-8 (2.29) cultivars. Among the sixteen taro cultivars tested, cultivars CA-21, CA-49, KCS-3 and IG Collection-8 were found to be promising in terms of both corm and cormel yields and benefit cost ratio, hence same can be recommended for cultivation in Rayalaseema region of Andhra Pradesh.
The present investigation entitled “Studies on Integrated Nutrient Management Practice for Tissue Culture Banana cv. Grand Naine” was carried out at Horticultural College and Research Institute, Anantharajupet during 2012-13. The experiment was laid out in randomized block design replicated thrice with eleven treatments comprising application of recommended dose of fertilizers (RDF) through inorganic fertilizers and organic manures in different proportions along with biofertilizers like Azospirillum, PSB and Frateuria aurantia to plant crop. Studies different growth characters at different stages of growth (3, 5 MAP and shooting), occurrence of phonological stages, bunch yield and its attributes and quality parameters including shelf life in plant crop cycle.

With respect to growth parameters, the highest plant height and pseudostem girth was registered with the application of 80% RDF (inorganic) = 20% RDF (Vermicompost) + Azospirillum + PSB + Frateuria aurantia both at 3 MAP and 5 MAP. Whereas, functional leaves and leaf area plant$^{-1}$ and total number of leaves emerged in a crop cycle were highest at various stages of crop growth in plants that received 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + pSB + Frateuria aurantia.

Highest nitrogen content in the index leaf was recorded at 3 MAP and 5 MAP with the application of 80% RDF (inorganic) + 20% RDF (vermicompost) + Azospirillum + PSB + Frateuria aurantia whereas at shooting application of 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia has registered higher nitrogen content. Application of either 80% RDF (inorganic) + 20% RDF (vermicompost) + PSB or 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia has recorded highest phosphorous content in the index leaf at 3 MAP and 5 MAP whereas at shooting, application of 80% RDF (inorganic) + 20% RDF (FYM) + PSB has registered highest phosphorus content in index leaf. Application of 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia has recorded highest leaf potassium content in index leaf at 3 MAP, whereas, the treatment 80% RDF (inorganic) + 20% RDF (vermicompost) + Azospirillum + PSB + Frateuria aurantia has registered highest potassium in the leaf (3.54%) at 5 MAP. Application of 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia has recorded highest potassium content in index leaf at shooting stage. Observed gradual exhaustion of nutrients (nitrogen, phosphorus and potassium) in all the treatmental plots at harvest when compared to the initial fertility status of experimental plots. The depletion of nutrients was less in the plots that received different INM treatments than the plots that received 100% RDF through inorganic fertilizers alone.

Bunch yield and its attributing characters like, maximum number of hand and fruits bunch$^{-1}$ and higher fruit girth, bunch weight and bunch yield were recorded with the application of 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia, but higher fruit length was observed with application of 80% RDF (inorganic) + 20% RDF (vermicompost) + Azospirillum + PSB + Frateuria aurantia. Pertaining to quality parameters, significant differences were not evident in acidity, reducing and non reducing sugar content in fruits. However, highest TSS and longer shelf life was recorded in the fruits obtained with application of 80% RDF (inorganic) + 20% RDF (vermicompost) + Azospirillum + PSB + Frateuria aurantia.

Highest net returns were recorded with 80% RDF (inorganic) + 20% RDF (FYM) + Azospirillum + PSB + Frateuria aurantia followed by 80% RDF (inorganic) + 20% RDF (vermicompost) + Azospirillum + PSB + Frateuria aurantia.
On the basis of the results obtained in the present investigation, it can be inferred that application of either 80% RDF (inorganics) + 20% RDF (Vermicompost) along with 50g *Azospirillum*, 50g PSB and 25g *Frateuria aurantia* or 80% RDF (inorganics) + 20% RDF (FYM) along with 50g *Azospirillum*, 50g PSB and 25g *Frateuria aurantia* can be recommended for tissue culture banana cv. Grand Naine (AAA) for reaping optimum bunch yield and higher net returns in Rayalaseema region of Andhra Pradesh.

169) “Studies on the effect of salt and VAM fungi on growth of juice and table grape cultivars”- B.R.Srujana.

**ABSTRACT**

The present pot culture experiment “Studies on the effect of salt and VAM fungi on growth of juice and table grape cultivars” was carried out at Grape Research Station, Rajendranagar, Hyderabad from November 2012 to May 2013. The study was conducted under two experiments viz., “Effect of salt and VAM fungi on growth of table grape cultivars” and “Effect of salt and VAM fungi on growth of juice grape cultivars”. The experiments were carried out in Completely randomized factorial design with four replications.

This experiment was conducted with the following objectives 1) To study the influence of varying levels of NaCl on juice and table grape cultivars 2) To identify salt tolerant juice and table grape cultivars and 3) To study the influence of VAM fungi in enhancing salt tolerance in juice and table cultivars of grape. In an attempt to achieve this, three table grape cultivars viz., Thompson Seedless, Madhu Angoor and Kishmish Rozoviz under different water salinity levels (control, 18 meq/L and 36 meq NaCl/L), were imposed with two treatments:(1) control (without mycorrhiza) (2) inoculated with VAM (Vesicular Arbuscular Mycorrhiza).

It was observed that in Madhu Angoor the morphological parameters like shoot length, number of leaves, root length, root volume, shoot dry weight, root dry weight, root to shoot ratio were significantly high indicating their vigor followed by Thompson Seedless. Physiological parameters like chlorophyll ‘a’, total chlorophyll, relative water content (RWC) were also significantly high while specific leaf weight, Na+ - K+ ratio recorded less in Madhu Angoor followed by Thompson Seedless whereas it was vice-versa in Kishmish Rozoviz. Therefore table seeded variety Madhu Angoor was identified as salt tolerant cultivar.

Similar study was conducted in three juice grape cultivars viz., Concord, Bangalore Blue and E 12/2. Among these varieties E 12/2 recorded higher shoot length, stem diameter, root length, root volume, shoot dry weight, root dry weight, root to shoot ratio and RWC while specific leaf weight uptake of sodium and chloride ions was least thus indicating higher salt tolerance in E 12/2 followed by Bangalore Blue and Concord.

The mycorrhizal inoculation is capable of alleviating the damage caused by salt stress in both table and juice grape varieties by way of significantly increasing the shoot length, number of leaves, leaf area, root length, root volume, shoot and root dry weight, through enhancing relative water content, K+ uptake and by exclusion of toxic ions like sodium and chloride. VAM fungi inoculation is thus helpful in salt affected soils.


**ABSTRACT**
The present investigation entitled “Studies on the effect of time of planting and harvesting on growth, herbage yield and quality in kalmegh. (Andrographis paniculata Nees.)” was carried out at Vegetable Research Station, Rajendranagar, Hyderabad during kharif 2012-13. The main objective of the investigation was to find out the effect of time of planting, stage of harvesting, and their interaction on growth, herbage yield and quality of kalmegh. The experiment was laid out in FRBD and replicated thrice.

The results of the experiment revealed that plant height, number of branches per plant, number of leaves per plant, leaf area, LAI, fresh and dry herb weight were significantly affected due to planting dates at 15, 30 and 45 DAP. Among different planting treatments, the crop planted on 1st August recorded maximum values for plant height, number of branches per plant, number of leaves per plant, leaf area, LAI, fresh and dry herb weight which were significantly superior over other planting treatments. Dry herbage and andrographolide yields were also significantly influenced due to different planting treatments at harvest. The crop planted on 1st August also recorded maximum values for dry herbage and andrographolide yields at harvest.

Different harvesting treatments had significant influence on plant height, number of branches per plant, number of leaves per plant, leaf area, LAI, leaf stem ratio, fresh and dry herb weight, dry herbage yield, andrographolide content and yield at harvest. Among harvesting treatments, the crop harvested at pod setting stage recored maximum values for plant height, number of branches per plant, fresh and dry herb weight, dry herbage and andrographolide yields. Number of leaves per plant, leaf area, LAI and andrographolide content were, however, maximum with the crop harvested at flowering stage. Maximum leaf stem ratio was observed with the crop harvested at pre flowering stage.

At harvest, interaction between planting and harvesting treatments significantly influenced plant height, number of branches per plant, number of leaves per plant, leaf area, LAI, fresh and dry herb weight, dry herbage yield, leaf stem ratio and andrographolide yield. The crop planted on 1st August and harvested at pod setting stage (D3H3) recorded maximum plant height, number of branches per plant, fresh and dry herb weight, dry herbage and andrographolide yields. Number of leaves per plant, leaf area, LAI were, however, maximum with the crop planted on 1st August and harvested at flowering stage (D3H2).

The present study clearly indicated that planting on 1st August and harvesting at pod setting stage were superior to other planting and harvesting treatments with overall better performance in kalmegh.

171) “Effect of graded levels of nitrogen and phosphorus in gladiolus (Gladiolus grandiflorus L.) cv. White Prosperity.”- K.Chandana.

**ABSTRACT**

A study was conducted to evaluate the effect of graded levels of nitrogen and phosphorus on vegetative, floral and corm parameters of gladiolus at Horticultural College and Research Institute, Venkataramannagudem in 2012-13. The observations were recorded at 30, 60 and 90 days after planting and the effect of nitrogen, phosphorus and their interaction were analyzed on the vegetative, floral and corm parameters. The spike yield was maximum with nitrogen dose of 300 kg ha\(^{-1}\), phosphorus dose of 200 kg ha\(^{-1}\) both individually and in combination. Similar trend was observed in the qualitative characters like longevity of first floret on spike, rachis length and number of florets per spike. The spike length and flower
diameter were maximum with the application of nitrogen at 400 kg ha\(^{-1}\) plus phosphorus at 200 kg ha\(^{-1}\). The total weight of corm and cormels per plant was maximum with the treatment combination of nitrogen at 400 kg ha\(^{-1}\) plus phosphorus at 200 kg ha\(^{-1}\) which may be attributed to the highest number of cormels produced per mother corm. The vegetative parameters like plant height, number of leaves, leaf area, dry weight of leaves, dry weight of flower, growth parameters like leaf area index (LAI), crop growth rate (CGR), net assimilation rate (NAR) and the uptake of nitrogen and phosphorus was recorded highest with a dose of nitrogen at 300 kg ha\(^{-1}\) plus phosphorus at 200 kg ha\(^{-1}\). Even though the fertilizer dose of nitrogen at 400 kg ha\(^{-1}\) plus phosphorus at 200 kg ha\(^{-1}\) was good at initial crop growth stages, the same was not continued in the later stages with respect to the growth parameters. The corm yield, weight of corm, corm diameter and cormel weight was maximum with the dose of nitrogen at 300 kg ha\(^{-1}\) and phosphorus at 200 kg ha\(^{-1}\). The interaction effect suggested that vegetative, floral and corm parameters responded better to the increasing levels of nitrogen and phosphorous up to 300 kg ha\(^{-1}\) and phosphorus at 200 kg ha\(^{-1}\). Beyond this level, the improvement in the said parameters was found to be non-significant in most of the cases. The gross returns and net returns were recorded at maximum by the application of 300 kg ha\(^{-1}\) of nitrogen and 200 kg ha\(^{-1}\) of phosphorus resulting in a maximum value (2.64) of benefit-cost ratio.

Among all the treatment combinations, considering the best values in respect of vegetative, floral, corm characteristics and net-profit, it was found that the treatment combination of nitrogen at 300 kg ha\(^{-1}\) and phosphorus at 200 kg ha\(^{-1}\) proved to be the best for commercial cultivation of gladiolus under Venkataramannagudem conditions.

172) “Evaluation of Chrysanthemum (Dendranthema grandiflora Tzvelev.) cultivars for growth, yield and storage life under open field conditions”- B. Santhi Swaroopini.

ABSTRACT

The present experiment entitled “Evaluation of Chrysanthemum (Dendranthema grandiflora Tzvelev.) cultivars for growth, yield and storage life under open field conditions” carried out at Horticultural College and Research Institute, Anantharajupet, Dr. Y.S.R. Horticultural University, Andhra Pradesh during the kharif season of year 2012-13 to select suitable cultivars for commercial cultivation and the data collected from this experiment was further utilized for the genetic analysis viz., heritability, PCV (Phenotypic coefficient of variation), GCV (Genotypic coefficient of variation), correlation and path coefficient analysis.

The experiment laid out with 13 different treatments in a randomized block design (RBD) with three replications. The treatments include twelve cultivars viz., Geethanjali, Rekha, Co-3, Raichur, Silper, PAU-B-107, Pusa Anmol, Pusa Semidouble, Rajamundry, Shanthi, Yellow Double, White Double along with one check (Chandini).

Among the vegetative characters, cv.Geethanjali recorded maximum plant height (26.07, 42.28, 53.63, 58.31 cm) at 30, 60, 90 and 120 DAT, Where as cv.PAU-B-107 recorded Maximum plant spread (22.73, 40.20, 48.08, 51.27 cm) and numbers of primary branches (5.96, 10.87, 14.97, 16.30) at all the stages of crop growth and also produced maximum number of suckers plant\(^{-1}\) (21.50).

Significant variation was observed for flower characters among different cultivars. Early flower bud initiation (63.33 days), minimum days taken to 50% flowering (93.00 days), lowest number of days to first harvest (112.33 days), maximum duration of flowering (71.83 days) and maximum flower diameter (5.90 cm) was recorded by the cv.Co3. Maximum number of flowers spray\(^{-1}\) (16.50), maximum number of flowers plant\(^{-1}\) (169.33) and maximum flower weight (5.40 g) were recorded by the cv.PAU-B-107. Spray length was maximum in cv.Geethanjali (25.23 cm) followed by cv.Raichur (25.10 cm).
Among the thirteen cultivars studied PAU-B-107 recorded maximum number of days to 50% flower wilting when kept in 200 gauge polyethylene bag (6.67 days) followed by cv. Rajamundry (5.87 days) when compared to other packing materials studied.

Cv. PAU-B-107 exhibited more resistance towards the pest and disease infestation with minimum number of *Spodoptera litura* plant\(^{-1}\) (0.67) and minimum PDI (Alterneria leaf blight) (5%).

Maximum flower yield plant\(^{-1}\) (293.33 g), yield plot\(^{-1}\) (10.56 kg) and yield hectare\(^{-1}\) (264 q) was found maximum in the cv. PAU-B-107 due to production of more number of flowers plant\(^{-1}\) which resulted into maximum net returns (Rs 2,67,510 ha\(^{-1}\) ) and B:C ratio (2.08).

With respect to genetic parameters number of flowers plant\(^{-1}\), spray length (cm), flower diameter (cm), number of flowers spray\(^{-1}\), flower weight (g) and flower yield plant\(^{-1}\) (g) had high PCV, GCV, heritability and genetic advance as percent of mean where in improvement in these characters which can be brought through simple selection programme. In correlation studies, number of flowers plant\(^{-1}\), flower diameter (cm), flowering duration (days) and number of flowers spray\(^{-1}\) showed significant positive correlation with yield both at phenotypic and genotypic level suggesting good scope for improvement of yield. In Path coefficient analysis, flowering duration (days), number of flowers plant\(^{-1}\) and flower weight (g) directly influenced the flower yield as first ranking components.

Further, among all the cultivars studied PAU-B-107, Co-3 and Pusa Anmol were found to be promising regarding growth and yield characters and the same may be recommended for commercial cultivation under open field conditions.

173) “*Studies on the performance of gerbera cultivars in growbags and soil media under naturally ventilated polyhouse.*”- S. Mahaboob Basha.

**ABSTRACT**

A study was conducted during 2012-2013 to evaluate different gerbera cultivars to assess their performance in growbags and soil media under naturally ventilated polyhouse to study the vegetative, flowering and post harvest behaviour for cut flower production at Horticulture College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. Kadapa district of Andhra Pradesh.

The experimental trial was laid out in RBD with three replications and 14 treatments (14 cultivars) viz., Salvadore, Sangria, Intense, Rosalin, Silvester, Cacharelle, Sunway, Primrose, Zingaro, Dune, Danaellen, Shimmer, Dalma, Imperial with plant and line spacing of 30 cm x 30 cm. Maximum plant height (47.13 cm and 28.23 cm) was recorded by the cultivars Sangria and Intense in soil and growbags respectively at 210 DAP.

The cultivars Sangria and Silvester recorded maximum plant spread of 76.33 cm and 42.26 cm at 210 DAP in soil and in growbags respectively. The cultivars Sangria and Zingaro registered maximum leaf length (42.42 cm and 26.47 cm) whereas the cultivars Salvadore and Silvester produced broader leaves (18.70 cm and 10.86 cm) at 210 DAP in soil and in growbags respectively. Maximum leaf area of 537.31 dsm\(^{2}\) and 351.95 dsm\(^{2}\) was recorded in the cultivars Sangria and Silvester in soil and in growbags respectively. When compared with all the cultivars first flower bud appearance was found 38.20 days after planting in cv. Silvester but the same cultivar took maximum number of days to establish and to putforth new flower bud by taking 83.10 days in growbags. The cv. Zingaro took less number of days to bud burst
(7.13 and 8.53 days) in soil and in growbags respectively whereas in soil cv. Rosalin (4.20 days) and in growbags cv. Silvester (5.20 days) reached early to harvestable stage from bud burst.

The cultivar Cacharelle produced flowers of longer stalk length (85.60 cm and 59.18 cm) both in soil and in growbags whereas, the cultivars Cacharelle and Silvester produced flowers with larger diameter of 13.10 cm and 12.21 cm in soil and growbags respectively. The cv. Sangria registered as a high yielder among the 14 cultivars of gerbera by producing maximum number of cut flowers per plant per year (37.01) and maximum number of flowers per square metre per year (258.87) when soil is used as media.

In tap water, the cv. Salvadore lasts longer in vase for 8.67 days whereas the cv. Rosalin lost the consumer acceptability earlier among the cultivars tested and found fresh for only 5.53 days. The cv. Imperial ranked first for sensory quality attributes by scoring 26.6 aggregate sensory scores out of 30. Further, among all the cultivars studied Sangria and Salvadore were found superior to grow in soil whereas cultivars Intense and Silvester were found suitable to grow in cocopeat filled growbags however, growbag culture has to be standardized before recommending to the farming community.

174) “Evaluation of certain varieties and hybrids of muskmelon (Cucumis melo L.) for yield and quality traits”- P.Sushmitha.

ABSTRACT

The present investigation “Evaluation of certain varieties and hybrids of muskmelon (Cucumis melo L.) for yield and quality traits” was conducted during the period from February-May, 2012 at Horticulture College and Research Institute, Dr. Y.S.R Horticultural University, Anantharajupet, Y.S.R District of Andhra Pradesh. The experiment was laid out in RBD with three replications and sixteen treatments (eight varieties viz., Alpur, Arka Jeet, Bathesa, Ingan, Kanpur, Pusa Madhuras, Sharabat-e-Anar, Siddavatam Dosa and eight hybrids viz., Amul-9, Caribbean Queen RZ, Gladial RZ, LMS-1, Madhumati, NMMH-24, NS-910 and Sun). The spacing adopted was 1.5m×0.5m.

The results on growth parameters revealed that maximum number of primary and secondary branches vine-1 was observed in the variety, Arka Jeet (5.89 and 6.67, respectively) and in the hybrid, NMMH-24 (5.27 and 6.12, respectively). Higher number of primary branches developed on the main vine contributed for production of more number of perfect flowers in Arka Jeet and NMMH-24.

With regard to reproductive parameters, lower node at which first staminate flower appeared was observed in the variety, Arka Jeet (2.12) and in the hybrid, Gladial RZ (2.33). Earliest node at which first perfect flower appeared was recorded in the variety, Ingan (5.23) and in the hybrid, Gladial RZ (4.33). Lateral number on which first perfect flower appeared was less in the varieties, Sharbat-e-Anar (1.85), Ingan (1.99) and Pusa Madhuras (1.99) and in the hybrids, Gladial RZ (1.23), Caribbean Queen RZ (1.45) and Sun (1.45).

Number of days taken for first staminate and perfect flower appearance was recorded less in the variety, Ingan (31.12 and 36.12, respectively) and in the hybrid, Gladial RZ (29.56 and 34.11, respectively), which is an indication of earliness. The variety, Pusa Madhuras (260.88) and the hybrid, Madhumati (203.56) recorded less number of staminate flowers vine-
1. The variety, Arka Jeet (19.77) and the hybrid, NMMH-24 (13.67) recorded more number of perfect flowers vine-1 and sex ratio was significantly lower in the variety, Arka Jeet (17.83) and in the hybrid, Madhumati (18.96). The data on yield and yield attributing parameters indicated that number of fruits vine-1 was significantly high in the variety, Siddavatam Dosa (900.33g) and in the hybrids, Madhumati (1120.66g) and LMS-1 (1120.33g). The variety, Kanpur (2.12 kg vine-1 and 21.20 t ha-1) and the hybrid, NMMH-24 (2.45 kg vine-1 and 24.53 t ha-1) were found superior over other varieties and hybrids with respect to yield vine-1 and yield ha-1, respectively.

Among the varieties and hybrids, Bathesa and LMS-1 recorded maximum fruit length (20.12 cm and 16.10 cm, respectively) whereas, the variety, Siddavatam Dosa and the hybrid, LMS-1 recorded maximum fruit width (13.51 cm and 16.97 cm, respectively). Fruit size in all the varieties was categorized as small to intermediate except, Arka Jeet (small) and Siddavatam Dosa (intermediate) while, it was intermediate in all hybrids. Seed cavity length (4.55 cm and 6.57 cm) and seed cavity width (5.58 cm and 6.95 cm) were minimum in the variety, Arka Jeet and in the hybrid, Madhumati, respectively. Seed cavity size was ranged from small to very large in varieties whereas, it was medium to very large in hybrids.

In the respect of fruit quality traits, high TSS and total sugars were noticed in the varieties, Kanpur (12.03 °Brix and 15.58 %) and Alpur (11.33 °Brix and 15.02 %) and in the hybrids, Madhumati (12.68 °Brix and 16.63 %) and NMMH-24 (12.03 °Brix and 14.05 %), respectively. Per cent acidity was less in these varieties (0.06 % and 0.08 %) and hybrids (0.07% and 0.06%). Based on sensory evaluation (organoleptic test), the varieties, Kanpur, Alpur, Pusa Madhuras, Siddavatam Dosa, Bathesa and the hybrids, Madhumati, NMMH-24, Sun and NS-910 were adjudged best in terms of fruit flavor, taste and aroma.

The observation on incidence of pest and diseases in muskmelon revealed that the variety, Sharbat-e-Anar recorded less number of larval mines vine-1 and pumpkin beetles vine-1 (2.43 and 1.76, respectively) and the hybrids, Caribbean Queen RZ and Gladial RZ were affected with less number of larval mines vine-1 (1.77 and 1.84, respectively) and the hybrid LMS-1 (1.53) with less number of adult beetles vine-1. The Percent Disease Index (PDI) of downy mildew was at low ebb in the variety, Arka Jeet (15.67) and in the hybrids, Madhumati(18.30) and NMMH-24 (18.33). From the results of the present study, it is evident that the varieties, Kanpur, Siddavatam Dosa and Pusa Madhuras and the hybrids, NMMH-24, Sun and Madhumati performed well in terms of fruit yield and quality.


**ABSTRACT**

The present investigation entitled “Studies on effect of post harvest ethrel treatment and packaging on quality of mango cv. Baneshan at different maturity stages” was carried out during the year 2012-13 at Fruit Research Station, Sangareddy, Medak, Andhra Pradesh. A set of two experiments were carried out to evaluate the effect of post harvest ethrel treatment and polypropylene packaging on quality and shelf life of mango cv. Baneshan. Physico-chemical parameters i.e., physiological loss in weight (PLW), firmness, colour score, spoilage, shelf life, TSS, acidity, reducing sugars, total sugars, non reducing sugars and organoleptic score were recorded at an interval of 3 days at ambient temperature.
In experiment I “Effect of post harvest ethrel treatment on ripening and quality of mango cv. Baneshan at different maturity stages”, fifteen different treatments involving three different maturity stages (7-9°B, 9-11°B and 11-13°B) treated with four different concentrations of ethrel (250 ppm, 500 ppm, 750 ppm and 1000 ppm) and a control (water dip) were tried in a factorial completely randomised design with four replications. Ethrel at a concentration of 750 ppm recorded significantly better sugars, shelf life and organoleptic score. Mango fruits harvested at 9-11°B TSS stage recorded significantly better physico-chemical parameters and organoleptic score with highest shelf life of 9 days when compared to 7-9°B and 11-13°B.

Among the treatment combinations, mango fruits harvested at 9-11°B TSS stage with ethrel treatment @ 750 ppm recorded better physico-chemical parameters and organoleptic score with higher shelf life of 9 days.

In experiment II “Studies on effect of polypropylene packaging and ethrel treatment on shelf life and quality of mango cv. Baneshan”, fruits harvested at 9-11°B maturity stage were treated with ethrel @750 ppm and packed in polypropylene bags of 100 and 150 gauge with 1%, 2% and 3% ventilation. Among the treatments, mango fruits packed in polypropylene bags of 150 gauge with 1% ventilation extended the shelf life up to 13.2 days and recorded significantly higher fruit firmness thereby enhancing quality and shelf life.

In conclusion, mango cv. Baneshan harvested at 9-11°B TSS treated with ethrel at a concentration of 750 ppm had shelf life of 9 days only. Whereas, mango cv. Baneshan harvested at 9-11°B TSS treated with ethrel at a concentration of 750 ppm and packed in polypropylene bags of 150 gauge with 1% ventilation extended the shelf life up to 13.2 days.

176) “Evaluation of Red-Fleshed Guava Varieties for Processing into Nectar” – M.Pavan Kumar

**ABSTRACT**

The experiment titled “Evaluation of Red-Fleshed Guava Varieties for Processing into Nectar” was conducted at the Fruit research station Sangareddy, Medak district during the year 2010-2011. In this study five red fleshed guava varieties were evaluated for processing into nectar.

Based on the analysis of various physico-chemical characteristics of five red fleshed guava varieties, the Hybrid 1-6 and Red fleshed (local) were found to be the best varieties for processing in terms the colour of pulp, and chemical constituents such as TSS/ acidity, ascorbic content, total sugars and above all lycopene content in the pulp. The lycopene plays an important role in beverage preparation, as it masks the browning in the processed product. These two best varieties viz., Hybrid1-6 and Red fleshed were selected for preparation of nectar.

Further, the nectar recipe was standardized with the two varieties viz., red fleshed and hybrid1-6. Thus the nectar prepared with the composition of 20 percent pulp, 17°Brix total soluble solids and 0.3 percent acidity was rated superior for quality attributes viz., appearance, aroma and flavor, taste and overall acceptability through organoleptic evaluation in both the varieties.

The nectar prepared from two varieties of guava viz., red fleshed and hybrid 1-6 with a composition of 20% pulp, 17°Brix, and 0.3% acidity were evaluated for biochemical changes during storage up to 90 days at ambient temperatures. The titratable acidity, TSS, total sugars and
reducing sugars showed an increasing trend during the storage up to 90 days. The ascorbic acid and lycopene content decreased with increase in storage period from 0 to 90 days. However, these chemical constituents did not change markedly until three months of storage at ambient temperatures as compared to fresh nectar. The pink colour of nectar was stable up to 30 days and further browning was minimal in the product up to 90 days. This could be due to the presence of lycopene pigment and its masking effect on browning of guava nectar.

In conclusion, in this study guava variety Red-fleshed was found to be superior for nectar preparation. The nectar recipe with 20% guava pulp, 17% TSS and 0.3% acidity had highest organoleptic score. The acidity, TSS, total and reducing sugars of nectar showed an increasing trend during the progress of storage up to 90 days under ambient conditions. The ascorbic acid and lycopene content decreased, however no discolouration was observed and was acceptable and fit for consumption up to 90 days at ambient temperatures.

177) “Studies on fruit growth and development and standardization of maturity indices in different sapota (Manilkara achras (Mill.) Fosberg) cultivars” – G.Radha.

ABSTRACT

The present investigation entitled “Studies on fruit growth and development and standardization of maturity indices in different sapota (Manilkara achras (Mill.) Fosberg) cultivars” was carried out during 2012-2013 at Horticultural Research Station, Venkataramanagudem, West Godavari district, Andhra Pradesh, with the objective of understanding the pattern of growth and development, physical and biochemical changes that occur during growth and development of fruit and to standardize the maturity indices for best time of harvest for different cultivars of sapota. The present experiment was undertaken with different cultivars of sapota viz., PKM-1, PKM-3, DHS-1, DHS-2, Pala, Kalipatti, Cricket Ball, Singapore, Kirthibarthi and Virudhnagar in a Factorial Randomized Block Design (FRBD) with three replications.

The study revealed significant differences among the varieties for different fruit characters studied. Fruit length, width, weight, pulp weight, volume and seed weight increased in all sapota cultivars from fruit set till maturity at all stages of growth and development. Maximum fruit size, weight, pulp weight, volume, number of seeds and seed weight was recorded in the variety Cricket Ball followed by PKM-3.

Firmness of fruit was out of fruit pressure tester up to 120th day in all the varieties. The value of fruit firmness was high during initial stages of fruit growth and decreased gradually with increase of fruit maturity. At maturity the fruit texture was smooth and flesh colour beneath the skin was yellow in all the varieties. The flesh colour of fruit was reddish brown in case of PKM-3 and Cricket Ball, while it was yellowish brown in the remaining varieties. Latex flow and spined stigma were absent at maturity in all the varieties. The variety DHS-2 recorded the maximum number of days to attain harvestable maturity followed by cv. Cricket Ball.

The biochemical changes in fruit viz., TSS, TSS: acid ratio, total sugars, reducing sugars, non-reducing sugars increased continuously in all sapota cultivars from fruit set till maturity and titrable acidity exhibited decreasing trend throughout the development but ascorbic acid content had an initial increase up to 180 days and thereafter decreased continuously during development and declined on maturity. Among the different varieties, TSS, reducing sugars and total sugars were high in the cultivar Kalipatti followed by Pala, PKM-3 and Virudhnagar over the other varieties during growth and ripening stages.

The results suggest that in sapota fruits, it is not possible to decide the optimum stage of harvesting based on a single physical character. The stage of harvest could be recognized by considering both the physical and biochemical characters. The number of days taken for
optimum maturity in PKM-1, Pala, Singapore and Virudhnagar was 225 days. Kalipatti required 240 days, DHS-1 and Kirthibarti took 240-255 days, while PKM-3, DHS-2 and Cricket Ball took 255 – 270 days. The fruits harvested at optimum stage of maturity ripened properly and they possessed maximum TSS, reducing sugars, low acidity, good texture, fruit and flesh colour and organoleptic score was high.

A combination of different methods of assessing maturity is therefore recommended to establish appropriate stage of harvest for different sapota varieties. From the present investigation, it is clear that the optimum stage of harvest could be recognized by considering the physical characters (size, weight, skin colour, latex flow, spine stigma, texture and days to harvest), biochemical characters (TSS, total sugars, reducing sugars and organoleptic scoring) and days taken from fruit set can be employed as criteria for assessing the harvest stage in different varieties of sapota studied.


ABSTRACT

Studies on “Effect of N, P & K on growth, yield and quality of guava (Psidium guajava L.) cultivars under meadow system of planting” were carried out during the period from July, 2013 to January, 2014 at Fruit Research Station (FRS), Sangareddy, Medak district, Dr. YSRHU, A.P. with an objective of studying the effect of varieties and fertilizer levels on growth, yield and fruit quality of guava cultivars under meadow system planting.

Studies were conducted on the effect of two varieties i.e. Allahabad Safeda and Lalit and also effect of different fertilizer levels i.e. 65:30:30 g, 100:45:45 g, 135:60:60 g, 170:75:75 g and 205:90:90 g per plant on growth, yield and fruit quality of guava (Psidium guajava L.) cultivars with 10 treatments replicated four times in RBD with factorial concept.

Among the two varieties studied, Lalit responded well to different fertilizer doses when compared to Allahabad Safeda. Lalit recorded maximum plant height, stem girth, plant spread at east-west and north-south direction, total number of flowers per shoot, number of fruits per plant, average fruit weight, fruit volume, total soluble solids and ascorbic acid. Allahabad Safeda recorded maximum fruit set and minimum number of days taken for harvesting from flowering in meadow system of planting.

Among the different fertilizer levels (65:30:30, 100:45:45, 135:60:60, 170:70:70 and 205:90:90 g per plant) studied, increasing the fertilizer level from 65:30:30 to 135:60:60 resulted in increase of the number of fruits per plant, maximum average fruit weight, fruit girth, fruit volume, fruit yield and maximum storage life. But, further increase in fertilizer doses decreased the above characters in meadow system of planting of guava.

Among the interactions, Lalit with 135:60:60 g NPK per plant recorded maximum stem girth at 90 days and at harvest. Allahabad Safeda with 135:60:60 g of fertilizer level showed minimum number of days taken for flowering from first split of fertilizer application and minimum number of days taken for harvesting from flowering.

205:90:90 g NPK per plant recorded maximum total soluble solids, ascorbic acid content and total sugars but was at par with 170:70:70 g and 135:60:60 g NPK per plant.

Application of 135:60:60 g NPK per plant for two years old guava plant in two split doses were found to be optimum in increasing growth, fruit yield and quality of guava cultivars under meadow system of planting in Telangana conditions of Andhra Pradesh.
The present investigation on “Heterosis and combining ability studies in tomato (Lycopersicon esculentum Mill.) in Line x Tester analysis” was undertaken with eight lines (EC 145057, EC 163663, EC 238308, EC 257489, EC 320574-1, EC 338714, EC 338717 and EC 338735) and four testers (Arka Saurabh, Pusa Ruby, PED and Marutham). The parents and 32 F\textsubscript{1} hybrids along with one standard check (Arka Vikas) were evaluated for heterosis and combining ability at N.B.P.G.R Regional station Rajendra nagar, Hyderabad during \textit{rabi} and summer 2008-09 in a randomized block design with three replications. Genetic parameters like GCV, PCV, Heritability, Genetic advance and Character association were also studied for yield and yield contributing characters.

The analysis of variance revealed significant differences among the genotypes for all the traits studied. Further the line x tester was found significant for all the characters under study except for ascorbic acid content. The heritability was considerably high for ascorbic acid, seed content, plant height, rind thickness, fruit diameter, fruit length, fruit weight, fruit volume, days to 50\% flowering and yield per plant. The levels of heterosis were high in several crosses for fruit weight, fruit length, fruit diameter, fruit volume, rind thickness, TSS, ascorbic acid and fruit juice content.

The mean performance of the crosses (EC 163663 x Pusa Ruby, EC 257489 x Pusa Ruby and EC 257489 x Arka Saurabh) for fruit yield per plant was superior but none of the hybrids exhibited better yield over the standard check (Arka Vikas). The crosses EC 145057 x Pusa Ruby, EC 338717 x PED and EC 338717 x Marutham exhibited high rind thickness over standard check. The ascorbic acid content recorded high over standard check in crosses EC 257489 X Arka Saurabh, EC 238308 x Marutham, EC145057 x Marutham and EC145057 x PED respectively. TSS was high in crosses EC145057 x Arka Saurabh, EC145057 x Pusa Ruby and EC 163663 x Pusa Ruby over the standard check. The inbreds EC 338735 and EC 257489 resulted in the production of better single crossoes EC 338735 x Marutham and EC 257489 x Arka Saurabh for fruit yield per plant.

The study of correlations revealed that fruit yield per plant was positive and significantly correlated with fruit weight, fruit length, fruit diameter, fruit volume, rind thickness, TSS and fruit juice content.

The study of correlations revealed that fruit yield per plant was positive and significantly correlated with fruit weight, fruit length, fruit diameter, fruit volume, rind thickness, TSS and fruit juice content.
ABSTRACT

A field investigation entitled “Evaluation of cherry tomatoes (Solanum lycopersicum L. var. cerasiforme) for yield and quality under shade net” was carried out at experimental farm, Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. (Dist.), Andhra Pradesh during the early kharif-2013. The experiment consists of eleven cherry tomato genotypes viz., IIHR-2871(T1), IIHR-2872(T2), IIHR-2873(T3), IIHR-2751(T4), IIHR-2753(T5), IIHR-2876(T6), Laila(T7), Roja(T8), Ruhi(T9), Sheeja(T10) and AFA 602(T11) replicated thrice in a Randomized Block Design under 50 per cent shade net.

The results on growth parameters revealed that maximum plant height at 90 days after transplanting in Roja (313.26 cm) followed by Laila (312.20 cm). Sheeja (3.20) followed by IIHR-2876 (3.00) produced significantly highest number of primary branches plant-1. The genotype AFA 602 (28.40) took significantly minimum number of days for first flower initiation followed by Ruhi and Roja, which took 29.88 and 30.40 days respectively. Similarly the genotype, AFA 602 (70 days) took the shortest period from transplanting to first fruit harvest followed by Roja (71days). IIHR-2872 took least number of days (39.66) to 50 per cent plants to flowering and said to be an early genotype followed by Roja (41.33).

Highest number of flowers cluster-1 and number of fruits cluster-1 was noticed in the genotype Sheeja (10.70 and 9.46) followed by Ruhi and Laila (9.80, 7.80 and 9.60, 7.20 respectively). Maximum number of fruiting clusters plant-1 at harvest was recorded by Sheeja (31.46) followed by IIHR-2872 (29.80), while the genotype IIHR-2751 (14.60) recorded the minimum. Fruit set percentage was maximum in Sheeja (88.8) which is at par with Roja, Laila, AFA 602 and Ruhi with a fruit set values of 88.8, 86.53, 82.80 and 81.10 per cent respectively.

The longest fruit was recorded in genotype IIHR-2872 (4.12 cm) followed by Sheeja (4.06 cm) and Laila (4.05 cm). The genotype IIHR-2873 (4.17cm) followed by IIHR-2873 (3.67cm) produced significantly highest fruit width. Fruit shape index was found maximum in Sheeja (2.00) followed by Laila (1.91) and Roja (1.58). Significantly highest fruit volume was recorded in IIHR- 2872 (20.33 cc) followed by IIHR-2751 (18.26 cc). The highest mean fruit yield plant-1, fruit yield plot-1 and fruit yield hectare-1 was recorded in AFA 602 followed by Sheeja (3.70 kg, 40.68 kg, 53.70 tonnes and 3.64 kg, 38.68 kg, 50.96 tonnes respectively).

With respect to quality parameters TSS was maximum in Roja (8.46 0 B) followed by Laila (8.10 0B), titrable acidity was highest in IIHR-2873 (0.48 %) followed by Roja (0.45 %), highest ascorbic acid content was recorded in IIHR- 2753 (27.55 mg 100g-1) followed by Ruhi (27.38 mg 100g-1), lycopene content was maximum in genotype Roja (8.570 mg 100g-1) followed by Laila (6.85 mg 100g-1). The genotype Roja (8.41%) followed by IIHR-2871 (3.42%) recorded significantly maximum reducing sugars content. IIHR-2753 (1.68 %) followed by Sheeja (1.54) showed maximum values for non-reducing sugars. The cherry tomato genotypes AFA 602 and Sheeja outperformed other genotypes in terms of yield when grown during early kharif under 50 per cent green shade net. The reason might be the genetic potentiality of these genotypes to perform well under favourable micro climate. The genotypes AFA 602, Sheeja and Roja were found to be early maturing. With respect to quality parameters, the genotype Roja and Laila were found promising as they recorded higher values of total soluble solids, lycopene content and reducing sugars which can be better exploited in the processing industry.
ABSTRACT

The present investigation entitled “Studies on standardization of dye concentration, stage of harvest for tinting and post harvest keeping quality of Tuberose (cv.Suvasini) and Gladiolus (cv.White Prosperity)” was carried out in the laboratory of Floricultural Research Station, A.R.I, Rajendranagar, Hyderabad during year 2013-14.

A total set of four experiments were carried out, two in each crop in order to standardize the dye concentration, time of immersion for tinting and to optimize the stage of harvest for tinting in Tuberose cv. Suvasini and Gladiolus cv.White Prosperity. To standardise the dye concentration and time of immersion the parameters considered were colour obtained at 30 minutes interval after placing the spike in dye solution (by RHS colour chart), dye uptake at 30 minutes interval, percentage bud opening at the end of vase life, percentage increase in fresh weight (at the end of immersion) and floret size (cm). To optimize the stage of harvest for tinting, the parameters like days for opening of florets (25%,50% and 75%), floret size(cm), vase life(days), percentage of wilting of flowers on the day of tinting, percentage of wilting of flowers after first day of tinting and percentage of wilting of flowers at the end of vase life were taken into account. For vase life studies, colour of the spike after placing in the vase solution (with RHS colour chart), colour retained after one day, time taken for the flowers to fully loose the colour, water uptake, loss of water, ratio of water loss to water uptake,diameter of florets(cm), lipid peroxidase activity in tinted flowers and protein content in tinted flowers were taken in to consideration.

The experiment on standardization of dye concentration and time of immersion were carried out in a Factorial completely randomised block design with two factors as food dyes and hours of immersion. In both the crops of Tuberose (cv. Suvasini) and Gladiolus (cv.White Prosperity), 5% concentration of food dye with two hours of immersion showed a best colour shades with out edging at petals, with maximum bud opening percentage and the highest mean floret size. The experiment on optimization of stage of harvest was also carried out in a factorial completely randomised block design with food dyes and stages of harvest as two factors. In Tuberose cv.Suvasini, flower spikes harvested at stage 2(1-2 basal florets open) had a higher vase life of 8.01 days, least wilting percentage of 24.08, 34.55, and 43.24 on fifth, sixth and seventh day respectively, highest mean water uptake of 59.42 g.spike-1, lowest mean transpirational loss of 48.55 g.spike-1, lowest mean ratio of water loss to water uptake of 0.89, highest mean diameter of florets of 3.65 cm, least decrease of 14.97g/100g mean percentage of lipids and least decrease of 15.18 g/100g mean percentage of proteins. More benefit cost ratio of 1.83 was observed in the spikes tinted with Lemon yellow, Violet and Orange red followed by Kesar yellow, Kalakatta, Blue and Apple green (1.74). In Gladiolus cv.White Prosperity, the spikes harvested at stage 1(1-2 basal florets show colour) had a higher vase life of 8.16 days, least wilting percentage of 0, 5.46, and 30.01% on fourth fifth and sixth day respectively, maximum time of 8.56 days to fully loose colour, lowest mean transpirational loss of 29.17 g. spike-1, highest mean diameter of florets of 9.21 cm, least decrease of 4.52 g/100g mean percentage of lipids and least decrease of 12.59 g/100g mean percentage of proteins. Benefit cost ratio of tinting the
spikes with Lemon yellow, Violet and Orange red was 1.34 while with Kesar yellow, Kalakatta, Blue and Apple green it was 1.29.

Thus it can be concluded that for tinting the spikes of tuberose cv. Suvasini, the optimum stage of harvest is stage 2 (1-2 basal florets open) where as in gladiolus cv. White Prosperity, stage 1 (1-2 basal florets show colour) was found to be optimum.

182) “Genetic divergence studies in gladiolus (Gladiolus grandiflorus L.)” – Aido Taloh.

ABSTRACT

The present investigation entitled “Genetic divergence studies in gladiolus (Gladiolus grandiflorus L.)” was carried out during rabi 2013-14 at Floricultural Research Station, Agriculture Research Institute, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad. The experiment was carried out to study the genetic diversity in 50 gladiolus genotypes with 5 check varieties namely American Beauty, Arka Amar, Bindiya, Swarnima and White Prosperity using Augmented Block Design (Federer, 1956). Each genotype was grown in a plot of 3 x 3 m² area consisting of 150 plants spaced at 30 cm x 20 cm. The morphological characterization of gladiolus genotypes with respect to plant, leaf, flower and corm characters was done in each genotype following UPOV (International Union for the Protection of New Varieties of Plants) guidelines. Observations were recorded on 33 quantitative and 10 qualitative characters.

Analysis of variance revealed highly significant differences among 55 genotypes of gladiolus for all the thirty-three quantitative traits thus indicating wide variation among the genotypes. The gladiolus genotypes viz., Punjab Morning, Sagar, Mohini and IIHR-G-12 were found to be early flowering types. The genotypes namely Sagar, Hybrid 94-101, Pink Double, Advance, Shagun, Swarnima and Shubangini exhibited maximum flower size. The genotypes Arun, Golden Goddess, Hybrid 94-101 and Aldrion were adjudged as superior over other genotypes in terms spike length. The high multiplication rate was observed in the genotypes Apple Blossom, Darshan, Deeraj and Gold Beauty by producing more number of corms per plant.

High PCV and GCV were recorded in plant height, leaf area, spike weight, rachis length, number of florets per spike, number of spikes per hectare, number of corms per plant and corm weight indicating the existence of wider genetic variability for these traits in the genotypes under study and showing ample scope for selection of these characters.

High heritability coupled with high genetic advance as per cent of mean was observed in almost all the characters except number of leaves per plant, vase life and number of spikes per plant which indicated contribution of additive gene effects in the expression of these traits. Therefore improvement in these characters can be done through direct selection to select better genotypes for gladiolus. A significant positive correlation both at genotypic and phenotypic level was recorded between flower yield and plant attributes viz., plant height, leaf number of leaves at spike initiation, and days to spike initiation. Path coefficient analysis revealed that days to spike initiation recorded the highest direct effect on flower yield per hectare followed by spike length, number of florets per spike, plant height and flower diameter. Hence it would be rewarding to lay stress on these characters in selection programme for increasing yield.

Based on Mahalanobis D² analysis, gladiolus genotypes were grouped into eight clusters with maximum of 16 genotypes in Cluster VIII and minimum in Cluster II and VI each with 3 genotypes each. It is desirable to select genotypes from clusters having high inter cluster distance. In the present study, the highest inter cluster D² value was recorded between clusters V and VIII indicating that crosses may be attempted between the genotypes of cluster V (Aarthi, Pink Double, and Arka Amar) and cluster VIII (Advance, Candyman, Golden
Goddess, Hybrid 94-101, and White Prosperity) to obtain new desirable recombinants in gladiolus. Among all the characters, the most important character contributing to divergence was days to flowering.

Based on multivariate analysis, the cluster VII had scored high mean values for important economic attributes. As the magnitude of heterosis depends largely on the degree of genetic diversity of parental lines, the genotypes AC No.7, Aldrion, Swarnima can be used to derive a broad spectrum of genetic variability in the segregating generations for spike yield per hectare.

The mode of distribution of genotypes from different eco-geographical regions into various clusters was at random indicating that geographical distribution and genetic diversity were not related. Therefore, the selection of genotypes to widen the diversity or to generate new gene combinations should be based on genetic diversity rather than ecological geographic diversity.

183) “Studies on osmotic dehydration of karonda (Carissa carandas L.)” - L.Suhasini.

ABSTRACT

The present investigation entitled “studies on osmotic dehydration of karonda (Carissa carandas L.)” was carried out during 2013 – 2014 at college of Horticulture, Rajendranagar, Hyderabad. A set of two experiments were carried out to study the effect of sugar and salt as osmotic agents on osmotic dehydration of karonda in Completely Randomized Block Design with factorial concept and the treatments were replicated thrice. Osmotic dehydration process involves subjecting fruit pieces to aqueous solution of sugar with high osmotic pressure which removes 30-50% of the water prior to drying. These studies were aimed to know the effect of syrup concentrations (60⁰ and 70⁰ Brix) with duration (6, 18 and 24 hours) of osmosis as a first experiment and salt concentrations (2% and 5%) with duration (1, 2 and 3 hours) of osmosis as a second experiment.

After osmosis of the karonda slices in the sugar solutions these were laid on the hot oven drier for drying. After osmotic dehydration, the products were packed in high density polythene covers and stored in ambient temperature for a period of 4 months.

In the first experiment the physico-chemical properties, microbial count and organoleptic quality of the products were evaluated during the storage period. The range of moisture loss (32.24-45.70%), weight loss (28.78-39.22%), solid gain (5.24-13.56%), yield (20.38-26.64%), dehydration ratio (6.03:1- 5.59:1), rehydration ratio (1:2.88-1:3.46), acidity (4.18-2%), total sugars (30.22- 51.91%), ascorbic acid (4.78-3.53mg100g⁻¹), iron content (11.01-4.20mg 100g⁻¹), moisture content (13.38-12.39%) and lowest microbial count were observed in 70⁰Brix sugar syrup for 24 hours. An increase in syrup concentration from 60 to 70⁰Brix and duration of osmosis from 6 to 24 hours increased weight loss, solid gain and yield in the karonda slices. However osmotic pretreatment with 70⁰Brix sugar syrup for 18 hours resulted in highest sensory score (81.97) while it was lowest in control (49.90).

In the second experiment, the effect of salt as an osmotic agent on osmotic dehydration of karonda was studied. The physico-chemical properties, microbial count and organoleptic quality were evaluated during the storage of the products. The range of moisture loss (9.54-25.43%), weight loss (8.25-13.96%), solid gain (2.05-11.36%), yield (12.19-10.58%), dehydration ratio (5.63:1- 7.33:1), rehydration ratio (1:2.34-1:1.73 ), acidity (4.87-4.91%), ascorbic acid (5.52-5.91mg 100 g⁻¹), iron content (14.30-5.79 mg 100g⁻¹) and lowest microbial count were observed in 5%NaCl for 3 hours. An increase in NaCl concentration from
2% to 5% and duration of osmosis from 1 to 3 hours increased weight loss, solid gain and yield in the karonda slices. However osmotic pretreatment with 5% NaCl for 3 hours resulted in highest sensory score (82.05), while it was lowest in control (44.80).


ABSTRACT

A set of forty one genotypes of Yardlong bean (Vigna unguiculata (L.) Walp. ssp. sesquipedalis Verdc.) was evaluated in a Completely Randomized Block Design with three replications at student research farm, College of Horticulture, Dr.YSRHU, Rajendranagar during kharif, 2013 with an objective to study genetic variability, genetic divergence, character association and path coefficient analysis. The Analysis of Variance revealed significant differences among the genotypes for all the nineteen characters under study suggesting considerable amount of variability exists among the genotypes.

The phenotypic coefficient of variation was slightly higher in magnitude than genotypic coefficient of variation for all the characters indicating that all characters had interacted with influence of environment to some degree. High PCV and GCV were recorded for number of pods per plant, pod length, pod ascorbic acid content and pod yield per plant suggesting the existence of wider genetic variability for the traits in the genotypes under study. High heritability coupled with high genetic advance as per cent of mean was observed in case of plant height, terminal leaf breadth, length of cluster stalk, number of clusters per plant, number of pods per plant, pod length, pod girth, pod ascorbic acid content and pod yield per plant indicating the preponderance of additive gene action making selection effective. Number of primary branches per plant, terminal leaf length, length of harvesting time, number of pods per cluster, seed number per pod and seed protein content showed high or medium heritability and moderate genetic advance as per cent of mean revealing in heritability of these characters the presence of both additive and non additive gene action. The correlation study for nineteen characters of Yardlong bean indicated that all the traits except terminal leaf breadth, days to first flowering, days to 50 per cent flowering, days to 95 per cent pod maturity, pod ascorbic acid content and seed protein content had significant positive association with pod yield per plant at both genotypic and phenotypic levels.

Path coefficient analysis study revealed that length of cluster stalk and pod girth exerted high and positive direct effect on pod yield per plant and these traits recorded significant positive correlation with pod yield per plant signifying the importance of these traits in selection programme for crop improvement.

Genetic divergence was assessed among 41 genotypes of Yardlong bean for 19 characters using Mahalanobis’ D2 statistics. The genotypes were grouped into seven clusters. Pod length contributed maximum towards divergence followed pod ascorbic acid content, pod girth and 100 seed weight. Highest inter cluster distance was observed between cluster V and VII followed by cluster VI and VII. Highest cluster mean values were observed for most of the traits with the genotypes present in cluster VI.

Based on the D2 statistics genetic distances, cluster men values and clustering pattern the genotypes IC-582859, NSJ-362, IC-582850, IC-582872, IC-582851 and IC-582829 from III, V, and VI clusters could be used as best parents in crop improvement programme to produce desirable segregants for yield and yield traits in Yardlong bean.
The present investigation revealed that the genotypes IC-582859 and NSJ-362, IC-582850 and IC-582872 were found superior on the basis of the characters having high heritability, high genetic advance as per cent of mean and strong association and high direct effect on pod yield. Hence for these characters due weightage should be given in selection programme and as parental sources should be used in future breeding programmes of Yardlong bean.

185) “Morphological characterization and evaluation of jack bean (Canavalia ensiformis (L.) DC.) genotypes for yield and quality characters – L.Pradeepthi.

ABSTRACT

A field experiment was carried out on morphological characterization and evaluation of jack bean (Canavalia ensiformis (L.) DC.) genotypes for yield and quality characters at National Bureau of Plant Genetic Resources, Regional Station, Rajendranagar, during the period from August 2013 to February 2014. The study was conducted on 15 genotypes in a randomized block design with three replications. Highly significant differences were observed among 15 genotypes of Jack bean for all the 29 characters studied. Out of fifteen genotypes, PSR – 12202 for number of pods per plant, pod weight, marketable pod yield per plant, protein, magnesium, calcium, sodium, potassium and phosphorus content in pods while, IC – 512946 for plant height at last harvest, earliest flowering, fewer days to fruit set (for first formed flowers) and less number of days to first pod harvest whereas, IC – 541380 for number of primary branches per plant at first harvest, number of primary branches per plant at last harvest and number of seeds per pod were found to be superior based on their mean performance. Hence these genotypes may be further tested in different locations for their stable performance and thereafter may be selected as parental source for future breeding programmes.

The characters viz., plant height at first harvest, number of primaries per plant at first harvest, plant height at last harvest, number of primaries per plant at last harvest, pod weight, number of pods per plant, number of seeds per pod, 100 seed weight and pod yield per plant were observed with high genetic variability, high heritability in conjunction with high genetic advance as percent mean indicating the predominance of additive gene action on the expression of these traits and hence direct selection will be rewarding for improvement of these traits in Jack bean.

The correlation and path analysis studies revealed that the traits like pod weight and number of pods per plant were considered as primary yield contributing components as they showed highly significant positive correlation with pod yield per plant and also exhibited highest direct positive effects on pod yield per plant and hence, direct selection based on these traits would result in improved pod yield.

Considerable variation was found among the genotypes for morphological characters viz., growth habit (pole and bush), leaf density (sparse, intermediate and dense), stem colour (light green, purple and dark purple), flower colour (purple and white), pod shape (straight, intermediate and curved), pod colour (light green and green), pod beak length (short, medium and long), pod curvature (straight, curved and highly curved), pod surface (smooth and wrinkled) and seed colour (brown, reddish purple, white, greyish yellow and greyish orange). Whereas the traits like leaf vein colour, flower stalk, inflorescence emergence, flowering pattern and pod suture colour has no variability.
The present investigation entitled “Effect of potting media on growth of cashew rootstocks” was carried out at College of Horticulture, Rajendranagar, Hyderabad during 2013-14. The experiment was carried out in Factorial Randomized Block Design with three replications.

The treatments used were four varieties and six potting media. The varieties were V1 (BPP-5), V2 (BPP-8), V3 (BPP-9) and V4 (VRI-2). The Potting media were PM1 (Red earth + FYM + Sand + Neem seed powder in 1:1:1:1 ratio), PM2 (Red earth + FYM + Sand + Custard apple seed powder in 1:1:1:1 ratio), PM3 (Red earth + FYM + Sand + Pongamia seed powder in 1:1:1:1 ratio), PM4 (Red earth + FYM + Sand + Vermicompost in 1:1:1:1 ratio), PM5 (Red earth + FYM + Sand + Cocopeat in 1:1:1:1 ratio) and PM6 (Red earth + FYM + Sand in 1:2:1 ratio).

This experiment was conducted with an objective to find out the effect of potting media composition on germination and growth of different rootstock along with the interaction effects of variety and potting media composition. The data was recorded on number of days for germination, rate of germination, germination percentage, number of leaves, leaf area, internodal length, seedling girth, seedling height, root length, dry matter content of shoot, dry matter content of root, shoot to root ratio, nutrients analysis of plant and potting media.

In the present study, among the varieties V1 recorded least number of days for germination (16.82) and maximum rate of germination (5.08). V4 recorded significantly maximum percentage of germination (88.89), number of leaves (8.19), internodal length (3.38 cm), seedling height (13.21 cm), root length (21.24 cm), dry matter content of shoot (34.83 %), dry matter content of root (19.84%), shoot to root ratio (1.77) and lowest percentage of nutrients in the potting medium (N-0.01, P-0.005 and K-0.031). V2 recorded the highest leaf area (53.89 cm²), seedling girth (2.23 cm) and plant nutrients (N- 2.78, P-0.53 and K - 0.99). Hence, the variety (V4) VRI-2 followed by (V2) BPP-8 were found vigorous.

Among the different potting media PM1 recorded minimum days for germination (20.72) and maximum rate of germination (4.9). PM2 recorded significantly maximum germination percentage (88.33%), number of leaves (8.11), leaf area (54.09 cm²), internodal length (3.19 cm), seedling height (12.10 cm), seedling girth (2.22 cm), dry matter content of shoot (31.93 %), shoot to root ratio (1.71) and percentage of plant nutrients (N- 3.22, P-0.56 and K-1.03) and the lowest percentage of nutrients in the potting medium (N-0.006, P-0.002 and K-0.031). PM4 recorded significantly highest root length (21.43 cm) and dry matter content of root(20.32%). Hence, the potting medium PM2 (Red earth + FYM + Sand + Custard apple seed powder in 1:1:1:1 ratio) followed by PM1 (Red earth + FYM + Sand + Neem seed powder in 1:1:1:1 ratio) was found the best for production of vigorous rootstocks.

Among the interactions, the interaction of PM1V1 recorded significantly minimum days for germination (15.00) and maximum rate of germination (6.60). The interaction of PM2 with V1 and V4 recorded maximum germination percentage (96.67%). The interaction of PM2V4 recorded maximum number of leaves (10.07), internodal length (3.65 cm), seedling height (14.09 cm), dry matter content of shoot (40.70 %), shoot to root ratio (2.22). The
interaction of PM2V2 recorded significantly maximum leaf area (58.33 cm²) and seedling girth (2.45 cm). PM4V4 recorded significantly highest root length (22.50 cm) and dry matter content of root (22.47 %).

In the interactions, the interaction of PM2 with V4, i.e. PM2V4 followed by PM2V2 was found the best for production of vigorous and healthy cashew rootstocks. PM4 can also be adopted as best potting media for production of rootstocks.


ABSTRACT

The present investigation entitled “Effect of pinching and plant growth regulators on growth and yield of fenugreek (Trigonella foenum-graecum L.)” was carried out at Vegetable Research Station, Rajendranagar, Hyderabad during Rabi 2013-14. The fenugreek cv. APHU Methi-1 was used for conducting the experiment. The experiment was laid out in Randomized Block Design with factorial concept comprising 20 treatments and replicated thrice. The treatments consisted of pinching as one factor containing four pinching treatments viz., No pinching (P0), single pinching at 25 days after sowing (P1), single pinching at 45 days after sowing (P2), double pinching at 25 and 45 days after sowing (P3) and application of plant growth regulators was taken as another factor containing five treatments viz., Control (Water spray) (G0), 50 ppm gibberellic acid (G1), 75 ppm gibberellic acid (G2), 50 ppm naphthalene acetic acid (G3) and 75 ppm naphthalene acetic acid (G4). Five plants were selected at random from each treatment and tagged for recording biometric observations. The data were recorded at an interval of 30, 60 and 90 DAS for assessing parameters like plant height (cm), number of branches per plant, number of days taken to flower initiation, number of days taken to 50% flowering, number of flowers per plant, percent of pod setting, number of pods per plant, length of pod (cm), number of seeds per pod, seed yield per plant (g), seed yield per plot (g), seed yield per hectare (q), test weight (g), number of days to seed maturity, fresh and dry weight per plant (g) and benefit cost ratio.

The results emanated from the experiment recorded significantly maximum plant height, early flower initiation, early 50 per cent flowering, early maturity and maximum test weight with no pinching (P0) treatment. Single pinching at 25 DAS (P1) recorded significantly maximum number of branches, number of flowers, number of pods, length of pod, number of seeds per pod and seed yield whereas all the yield attributing parameters like number of flowers, number of pods, length of pod, number of seeds per pod and seed yield were recorded to be significantly minimum with double pinching at 25 and 45 DAS (P3). Maximum fresh weight and dry weight at 30 DAS were observed with single pinching at 45 DAS (P2). At 60 and 90 DAS maximum fresh and dry weights were observed with double pinching at 25 and 45 DAS (P3).

Among the application of plant growth regulators, foliar spraying of GA3 50 ppm (G1) thrice (25, 45 and 65 DAS) resulted in best performance of all parameters like plant height, number of branches, number of flowers, number of pods, length of pod, number of seeds per pod, seed yield, fresh weight and dry weight of fenugreek. Early flower initiation and early maturity was observed with application of GA3 75 ppm (G2).

Among the interactions between pinching and plant growth regulators, the treatment of no pinching with application of GA3 50 ppm (P0G1) resulted in maximum plant height and test weight. Maximum number of branches and yield attributes like number of flowers, number
of pods, length of pod and seed yield were recorded with single pinching at 25 DAS and application of GA3 50 ppm (P1G1). The economics of the experiment reveal that the pinching at 25 DAS with application of NAA 50 ppm (P1G3) gave highest B: C ratio (1.88).

188) “Study on the value addition of cashew apple juice by blending with mango, pineapple and sapota juice for RTS beverage” - Anindita Roy.

ABSTRACT

Cashew apple (Anacardium occidentale L.) is one of the important commercial plantation crop cultivated in tropical and subtropical regions of the world. Cashew apple is one of the primary by-products of cashew nut industry. The fruits should be processed and value added in order to reduce postharvest losses. In view of above an experiment was carried out entitled “Study on the value addition of cashew apple juice by blending with mango, pineapple and sapota juice for RTS beverage” during the year 2012-2013 at Horticultural College and Research Institute, Dr. Y. S. R Horticultural University, Venkataramannagudem, West Godavari district of Andhra Pradesh.

The focus of the present study is utilization of cashew apple for preparation of cashew apple RTS by using mango, pineapple and sapota juice. The experiment was conducted in completely randomized design (CRD) and statistically analysed for the parameters like colour, pH, density (Kg m$^{-3}$), total soluble solids (°Brix), titrable acidity (%), reducing sugars (%), TSS/Acid ratio, ascorbic acid (mg/100g), tannins (mg ml$^{-1}$), organoleptic evaluation, storage and net benefit were studied in the preparation of cashew apple RTS.

Among the treatments, it was observed that RTS prepared from mango with cashew apple juice blend of 25% cashew apple juice + 75% mango juice blend (T3) was best with pH of 3.45, 3.25 and 3.11, density kg/m$^{-3}$ of 0.91, 1.07 and 1.01, total soluble solid (Brix°) of 14.86, 15.46 and 15.70, titrable acidity (%) of 0.65, 0.59 and 0.32, reducing sugar (%) of 2.22, 2.59 and 2.64, TSS/Acid ratio of 22.87, 26.82 and 49.40, ascorbic acid (mg/100g) of 12.51, 11.76 and 11.66 at 0, 30 and 60 days respectively. Followed by RTS prepared from 25% cashew apple juice + 75% pineapple juice blend (T6) with pH of 3.55, 3.18 and 3.11, density (kg/m$^{-3}$) of 0.94, 1.08 and 1.02, total soluble solid (Brix°) of 15.10, 15.50 and 15.66, titrable acidity (%) of 0.58, 0.53 and 0.33, reducing sugar (%) of 5.04, 5.04 and 5.52, TSS/Acid ratio of 25.56, 30.06 and 49.87, ascorbic acid (mg/100g) of 25.25, 22.20 and 20.93 at 0, 30 and 60 days respectively.

Further, the organoleptic score for RTS prepared from mango with cashew apple juice blend of 25% cashew apple juice + 75% mango juice blend (T3) followed by 50% cashew apple juice + 50% mango juice blend (T2), and RTS prepared from 25% cashew apple juice + 75% pineapple juice blend (T6) and by 50% cashew apple juice + 50% pineapple juice blend (T5) were found best for their quality parameter upto 60 days of storage and they are economical for utilisation of cashew apple juice with different blends of mango and pineapple for their RTS preparation.

The pineapple RTS costs of ₹ 99 per litre, mango RTS costs of ₹ 60 per litre, sapota RTS costs of ₹ 50 per litre over the cashew apple RTS of ₹ 40 per litre as per the prevailing price of local market were taken into consideration for calculation of net benefit cost for the RTS prepared from cashew apple blended juices. The highest net benefit of ₹ 61.16 was found in 25% cashew apple juice + 75% pineapple juice (T6) followed by 50% cashew apple juice + 50% pineapple juice (T5) ₹ 46.95 followed by 25% cashew apple juice + 75% mango juice
(T3) ₹32.28 and the lowest net benefit ₹21.20 was found in 75% cashew apple + 25% sapota juice (T7) of their economic feasibility.

189) “Studies on genetic variability and correlation analysis in sweet potato (Ipomoea batatas (L.) Lam.) Genotypes”- Prathana Mohanty.

ABSTRACT

The experiment was taken up to elicit the information on magnitude of genetic variability, heritability and to predict the gains realized through selection, character association, cause and effect relationship and divergence for the quantitative characters in sweet potato (Ipomoea batatas (L.) Lam.) genotypes. Thirty genotypes of sweet potato were evaluated in RBD with three replications during kharif season of 2013 at Horticultural College and Research Institute, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among genotypes for different characters studied. Among all the genotypes studied, genotype Accession-22 recorded the highest root yield per hectare and found suitable to the local agro-climatic conditions. The genotypes 440127, SWA-2 and ST-14 were also found to be elite for different characters.

Among the characters studied, high PCV and GCV were observed for characters like vine length, vine internodal length, number of branches per plant, number of leaves per plant, total leaf area, number of roots per plant, root yield per plant, β-carotene content, starch content, total sugars, reducing sugars, non reducing sugars and total root yield per hectare content indicating high variability available in the germplasm for these characters for further improvement.

High heritability coupled with high genetic advance as per cent of mean was observed for characters vine length, vine internodal length, number of branches per plant, length of leaf lobe, number of leaves per plant, total leaf area, root girth, root yield per plant, β-carotene content, starch content, total sugars, reducing sugars, non reducing sugars and total root yield per hectare indicated that these characters were least influenced by the environmental effects, and these characters were governed by additive genes and selection will be rewarding for improvement of such traits.

The total root yield per hectare (t/ha) had significant positive correlation with traits like number of branches per plant, number of roots per plant, root girth, root yield per plant and β-carotene content suggesting the importance of these traits in selection for yield and can be identified as yield attributing characters for the genetic improvement of yield in sweet potato.

The total root yield per hectare (t/ha) was result of direct effect of number of branches per plant, number of roots per plant, root length, root yield per plant, starch content and reducing sugars. The high direct effect of these traits appeared to be the main factor for their strong association with total root yield per hectare.

Analysis for divergence using D² statistic revealed highly significant differences for different traits, grouping the 30 genotypes into 6 clusters. Cluster II had the maximum number of genotypes (8) followed by cluster I (7). Maximum inter cluster distance was observed
between clusters III and VI while the intra cluster distance was maximum in cluster II and VI. Highest percent contribution to divergence came from β-carotene content, starch content, total sugar, total leaf area, root dry matter content, number of leaves per plant, root yield per plant, petiole length, root girth, vine length and reducing sugar suggested that selection of one or two elite genotypes from divergent (II & VI) and (III & VI) clusters based on the above characters and crossing would result in more heterosis and novel hybrids.

Morphological parameters like tree height, stem girth, canopy spread recorded significant differences among the hybrids under local agro-climatic conditions of Bapatla. Out of 24 hybrid genotypes 15 showed early season flowering and the rest showed mid season flowering. Stem girth and canopy spread were in close association with number of branches and total number of flowers as well as number of hermaphrodite flowers per panicle and ratio of hermaphrodite to male flowers in many of the hybrids for example H 94 in set I, H 200 in set II and H 313 in set III. High yielding hybrids like H 94 in set I, H 180 in set II and H 313 in set III were found to have maximum ascorbic acid and tannin content in their apples. The nut yield per tree was found to be highest in the hybrids H 94, H 85 in set I, H 180, H 200 in set II and H 313, H 306 in set III. Individual kernels weighing more than 2 g were observed in the hybrids viz., H 94, H 85, H 200 and H 313 which were also good in nut yield per tree. However, all the hybrid genotypes under study produced medium sized kernels (kernel weight ranging between 1.2 g and 2.5 g) except only two (H 328 and H 338 in set III) which had low kernel weight (less than 1.2 g).

Phenotypic and genotypic correlations among yield and its attributing characters showed that nut yield was found to have positive and significant correlation with tree height, stem girth, mean canopy spread, flowering laterals per m² canopy, panicle length, primary branches per panicle, hermaphrodite flowers per panicle, fruits set and fruits retained till maturity. Genotypic path co-efficient analysis revealed that apple weight exhibited high and positive direct effect on nut yield followed by number of hermaphrodite flowers per panicle. Nut yield showed positive heterosis in six crosses (H 77, H 85, H 94, H 95, H 116 and H 117) over mid parent, five crosses over better parent (H 77, H 85, H 94, H 116 and H 117) and only two crosses (H 85 and H 94) over standard check among the hybrids of set I. In set II and set III, seven crosses (set II: H 180, H 187, H 193, H 194, H 200, H 203, H 206; set III: H 298, H 303, H 306, H 313, H 319, H 328 and H 338) had positive heterosis over mid parent and two crosses showed heterosis over standard check in set II: H 180 and H 200; and five over standard check in set III (H 303, 306, H 313, 319, 328 and 338). Maximum heterosis for nut yield per tree was registered by the hybrids H 94 (set I), H 200 (set II) and H 313 (set III). The present study revealed that the cross combinations H 200 and H 313 showed heterosis at early age and can be studied further for any possible improvement in the same.
191) “Impact of planting dates, micronutrients and GA₃ on flower and seed production in African marigold (Tagetes erecta L.)” – Ch. Rohit

ABSTRACT

An investigation entitled “Impact of planting dates, micronutrients and GA₃ on flower and seed production in African marigold (Tagetes erecta L.)” was conducted at HC&RI, Venkataramannagudem, during 2013-2014.

The experiment was laid out in split plot design to study the effect of planting dates (July 13, August 13, September 13 and October 13) and foliar spray of micronutrients (ZnSO₄ @ 0.5 %, FeSO₄ @ 1.0 %, Boric acid @ 0.5 %) and GA₃ @ 300 ppm on flower and seed production in African marigold.

Among the planting dates July 15th planting recorded maximum plant height, plant spread, number of branches per plant, stem diameter, biomass and also increased the duration of flowering, number of flowers per plant, flower yields/plant, seed yield/plant followed by August 15th. In other hand September planting results highest flower diameter, average flower weight, 1000 seed weight, seed germination %, seedling dry weight and seedling vigour index followed by August 15th. Besides October planting showed minimum number of days to bud initiation, flower opening, 50 % flowering and duration of flowering followed by September 15th. Among the foliar application (micronutrients & GA₃) at 20 DAT & 40 DAT, GA₃ @ 300 ppm has enhanced the plant height, plant spread, number of branches per plant, stem diameter, biomass, flower diameter, number of flowers per plant, flower yield, seed yield and early flower bud appearance, flower opening, 50 % flowering. On the other hand, pre-harvest application of ZnSO₄ @ 0.5 % was found to be the best treatment next to GA₃ as it increased all vegetative and yield parameters of marigold flowers. Among all the interaction treatments July 15th with application of GA₃ @ 300 ppm was found to be the best treatment combination for maximum characters.


ABSTRACT

A field experiment entitled “Effect of growth regulators on growth, seed yield and quality of Coriander (Coriandrum sativum L.) cv. Sudha” was conducted during Rabi 2013-2014 at Horticultural College and Research Institute Farm, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. district of Andhra Pradesh.

The experiment consists of 6 levels of plant growth regulators viz., GA3 (50 and 75 ppm), NAA (10 and 25 ppm) and Cycocel (100 and 250 ppm) as presoaking, foliar spray at 30 and 60 DAS. An absolute control was also maintained. The experiment consists of 7 treatments replicated thrice in a randomized block design. The results indicated that application of 75 ppm GA3 resulted in maximum plant height (78.09 cm). However, maximum number of primary branches per plant (7.13), number of secondary branches per plant (16.13), number of umbels per plant (28), number of umbellets per umbel (6.33), number of seeds per umbel (34.73), seed yield per plant (9.02 g) and seed yield per hectare (18.46 q) was maximum with 250 ppm
Cycocel. However GA375 ppm followed by GA350 ppm recorded minimum number days to 50 per cent flowering (40.33) and maturity (85.00).

Among the quality parameters, maximum carbohydrate content (23.09 %), protein content (16.12 %) was noticed with GA3 75 ppm. Similarly lowest moisture content (9.19 %) in seeds was also observed with 75 ppm GA3. While, the essential oil content (0.43 %) in seeds was maximum with GA3 50 ppm. Economics study showed that maximum net returns and B: C ratio (Rs.1,38,947 ha-1 and 3.91: 1) was recorded with Cycocel 250 ppm followed by GA3 75 ppm and Cycocel 100 ppm.

193) “Studies on the performance of different turmeric (Curcuma longa L.) cultivars under red sandy loam soils of coastal andhra pradesh”- M.Lavanya.

ABSTRACT

The experiment was taken up to elicit the information on performance of different turmeric (Curcuma longa L.) cultivars under sandy loam soils of coastal Andhra Pradesh to predict the best cultivar. Experiment carried out with twenty four cultivars of turmeric evaluated in RBD with three replications during Kharif of 2013-14 at Horticultural College and Research Institute, Dr.Y.S.R.H.U, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among the cultivars for different characters studied and the cultivar Shillong recorded the highest estimated fresh rhizome yield per hectare (74.30 t ha-1) followed by Roma (43.83 t ha-1) and Ranga (40.78 t ha-1) which were found suitable to red sandy loam soils of coastal Andhra Pradesh.

The growth performance of twenty four cultivars indicated significant variation at all stages of crop growth under red sandy loam soils of Venkataramannagudem. The maximum growth rate was observed between 120 and 180 days after planting. Shillong produced highest plant height (49.53 cm) which was on par with JTS-314 (46.86 cm), CLI-369 (46.56 cm), Ranga (46.26 cm) and Prathibha (46.06 cm). The cultivars Shillong (5.10), Roma (4.46), CLS-369 (4.13), Parbani (4.13) produced maximum number of tillers per plant. The highest number of leaves per plant (12.06) recorded in Sugandham which was on par with Parbani (11.53), CLI-316 (11.13) and KTS-8 produced largest leaf area (5843.83 cm2) and highest LAI (2.63) in JTS-314.

The higher number of primary rhizomes per plant was found in KTS-3 (9.33) which was on par with Roma (8.80), Ranga (8.66) and Shillong (8.66) whereas, the highest number of secondary rhizomes per plant was found in Shillong (11.06), Roma (11.00) and Ranga (10.93). The maximum size of mother rhizome (102.60 cm3) was found in KTS-3 followed by Kasturi avidi (65.33 cm3), Duggirala red (62.66 cm3), size of primary rhizomes in Roma (22.90 cm3) followed by KTS-8 (21.04 cm3), Salem (20.64 cm3) and size of secondary rhizome in Roma (7.62 cm3) was on par with Parbani (6.36 cm3) and CLS-369 (6.25 cm3). The maximum fresh weight of rhizomes per plant (388.80g) was found in Roma followed by Ranga (338.93g), Sonajuli (337.20g) and dry weight of rhizomes per plant was in Shillong (98.81g).

The maximum curing percentage of rhizomes (31.43%) was recorded in ACC-593 followed by KTS-8 (25.23%), KTS-6 (24.06), Ranga (23.10) and highest curcumin content of 4.11 per cent was recorded in JTS-314 which was on par with Prathibha (3.48%), Shilllong (3.47%) and CLI-316 (3.42%). The maximum oleoresin content of rhizomes (11.10%) was recorded in Kasturi avidi which was followed by KTS-3 (11.03%) and JTS-314 (10.16%).
The correlation studies revealed that, estimated fresh rhizome yield per hectare (t) had significant positive correlation with traits like plant height, number of tillers per plant, leaf area (cm$^2$), leaf area index, number of mother rhizomes per plant, number of primary rhizomes per plant, number of secondary rhizomes per plant, size of primary rhizome (cm$^3$), fresh weight of rhizomes per plant (g) and dry weight of rhizomes per plant (g) suggesting the importance of these traits in selection of a cultivar and it can be identified for its suitability under red sandy loam soils of coastal Andhra Pradesh.

194) “Studies on growth, yield and quality of different culinary cultivars of banana (Musa sp. L.)” – D. Sudhir Kumar.

**ABSTRACT**

The present investigation entitled “Studies on growth, yield and quality of different culinary cultivars of banana (Musa sp. L.)” was conducted at Horticulture Research Station, Kovvur, West Godavari during 2013-14. The objective of the experiment is to recommend a suitable cultivar with higher yield and good cooking quality for commercial cultivation in coastal areas of Andhra Pradesh. In field experiment, eight culinary banana cultivars viz., Bangrier, FHIA-3, Kothia, Burro Cemsa, Booditha Bontha Batheesa, Saba, Cuba and Kovvur Bontha were evaluated for growth and yield potential. The data collected from this experiment were also utilized for the correlation studies.

Among the culinary cultivars of banana evaluated, the maximum plant height was recorded in Booditha Bontha Batheesa and maximum plant girth in FHIA-03 at shooting stage. The higher number of suckers were observed in Bangrier, whereas the total leaves production was the highest in FHIA-03 followed by Booditha Bontha Batheesa. Similarly green leaves were higher in FHIA-03 followed by Kothia. Leaf area was significantly the highest in FHIA-03 followed by Booditha Bontha Batheesa, Bangrier and Saba. The early shooting was observed in Kothia whereas late shooting was recorded in FHIA-03 and similar trend was observed in days taken to harvest. The growth rate for plant height was maximum at 5-7MAP stage of crop growth in Burro Cemsa. FHIA-03 was observed the highest value for LAI at shooting stage.

Regarding to yield attributes, the maximum bunch weight and yield was recorded in FHIA-03. The number of hands bunch$^{-1}$ and fingers in 2nd hand were higher in FHIA-03 followed by Kothia, whereas finger length and finger girth were the highest in Booditha Bontha Batheesa. With respects to the quality, peel thickness was the highest in Kothia, pulp:peel was the highest in Burro Cemsa and Kothia. Starch percentage was observed to be more in Kovvur Bontha, whereas FHIA-03 was evaluated organoleptically as good. With regards to cooking quality FHIA-03 was the best, pulp dry matter content was found to be more in Saba. Comparatively the highest shelf life was recorded in Burro Cemsa and Cuba.

In correlation studies, significant positive association of yield plant$^{-1}$ was observed with plant girth at shooting, leaf area at shooting, bunch weight, number of hands bunch$^{-1}$ and fingers in 2nd hand. Therefore, improvement of these characters might be helpful in improving the yield in banana.

In banana, on basis of results obtained in the present investigation among eight cultivars of ABB and AABB genomic groups tested, FHIA-03 recorded highest yield followed by Kothia. The above cultivars/hybrid also performed well recording more values for hands
bunch, fingers in 2nd hand and total fruits bunch. FHIA-03 also recorded higher organoleptic score. Keeping the yield potential in view, the banana cv. FHIA-03 and Kothia can be recommended for commercial cultivation in coastal areas of Andhra Pradesh.


ABSTRACT

The present investigation entitled “Studies on the effect of different chemicals on the vase life of cut gerbera (Gerbera jamesonii Bolus ex. Hook) cv. Alppraz” was carried out at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district of Andhra Pradesh during December, 2013 to April, 2014. A total of four experiments were conducted and all the experiments were laid out in completely randomized design with factorial concept and replicated thrice.

An experiment consisting of sucrose at different concentrations was tried to test the efficacy of sucrose concentration on the water relations there by extending the shelf life. The cut gerbera flowers held in Sucrose 3 % vase solution recorded significantly higher values in water uptake (9.913 g/flower spike), transpirational loss of water (10.036 g/flower spike) and fresh weight change of flowers (96.340% of initial flower weight). Further, Sucrose 3% has recorded significantly lower values in scape bending curvature (7.767 degrees), optical density (0.025) and electrolyte leakage (23.077%) there by recorded significantly longest vase life (9.440 days) with higher total sugars content (3.950 mg/g fresh weight) in the flower petals.

Another experiment consisting of treatments with different biocides (sodium hypochlorite and calcium hypochlorite) at varied concentrations were tried in the vase solution. The flowers maintained in vase solution containing sodium hypochlorite 20 ppm has recorded significantly longest vase life (10.570 days) with higher values in water uptake (8.089 g/flower spike), transpirational loss of water (8.405 g/flower spike), water balance (3.753 g/flower spike), fresh weight change of flowers (100.463% of initial of flower weight) and total sugars content (3.700 mg/g fresh weight). SH 20 ppm also recorded significantly lower values in scape bending curvature (10.017 degrees), optical density (0.034) of vase solution and electrolyte leakage (27.738%) which have contributed to increased vase life of cut gerbera flowers.

In the third experiment, different mineral salts were tried (aluminum sulphate and calcium nitrate) at varied concentrations to find out their efficacy in increasing the vase life of cut gerbera flowers. Among all the treatments aluminum sulphate 600 ppm registered significantly longer vase life (10.283 days) due to increased water uptake (6.519 g/flower spike), reduced transpirational loss of water (7.059 g/flower spike), increased fresh weight change (86.591% of initial fresh weight) and water balance (3.591 g/flower spike) there by increased the total sugars content (3.836 mg/g fresh weight) in the flower petals. Further, it is observed that significantly lower values in scape bending curvature (11.870 degrees), optical density (0.024) and electrolyte leakage (25.453%) have contributed to increase the cut flower quality and vase life.

The best treatments, from the above three experiments were combined together in different combinations and tried to find out their efficacy in extending the shelf life of cut gerbera flowers along with their individual treatments. The cut gerbera flowers held in vase solution containing Sucrose 3 % + SH 20 ppm + Al2(SO4)3 600 ppm registered longer vase life (12.167 days) by recording significantly higher values in water uptake (11.167 g/flower spike), reduced transpirational loss of water (11.365 g/flower spike), improved water balance (3.807 g/flower spike) and improved total sugars content (4.701 mg/g fresh weight) in the floral tissue.
The other factors contributed in extending the longevity of cut gerbera flowers were significantly lower values in the scape bending curvature (7.995 degrees), lower optical density (0.016) and electrolyte leakage (24.861%). All these physiological and biochemical activities were improved through improved water status in the floral tissue of cut gerbera.

196) “Standardization of technology for extending shelf life of minimally processed potato” – P. Shireesha.

ABSTRACT

A set of two experiments was conducted at Horticultural Research Station (HRS), Venkataramanagudem, West Godavari district of Andhra Pradesh with an objective of studying the influence of cube size, vacuum, different gauges of polythene bag, chemical treatments and storage temperatures on quality and shelf life of minimally processed potato. The experiments were conducted in CRD with factorial concept and replicated thrice. The physico-chemical characters of the potato cubes were recorded during storage.

It was observed that physiological loss in weight (PLW), colour score, spoilage, total phenols and polyphenol oxidase enzyme activity showed increasing trend throughout the storage period. Reducing sugars, non-reducing sugars and total sugars were increased initially thereafter decreased towards the end of the shelf life whereas Total soluble solids (TSS), titratable acidity, ascorbic acid, starch and organoleptic score exhibited decreasing trend during storage.

Among the cube sizes, potato cube size of 2 cm$^3$ recorded significantly lowest physiological loss in weight, reducing sugars, total sugars, total phenols, minimum activity of polyphenol oxidase. The same treatment recorded the highest firmness, TSS, titratable acidity, starch content and ascorbic acid.

Among the polythene gauges, 200 gauge polythene bag showed minimum physiological loss in weight, reducing sugars, total sugars, polyphenol oxidase enzyme activity and maximum firmness, TSS, titratable acidity, ascorbic acid compared to potato cubes packed in 100 gauge polythene bag.

Potato cubes packed with vacuum recorded lowest physiological loss in weight, reducing sugars, total sugars, total phenols, minimum activity of polyphenol oxidase and highest firmness, TSS, titratable acidity, starch and ascorbic acid compared to potato cubes packed without vacuum.

Among the chemicals, potato cubes treated with 0.5% citric acid recorded lowest physiological loss in weight, spoilage, reducing sugars, total sugars, total phenols, minimum activity of polyphenol oxidase and highest firmness, TSS, titratable acidity, starch and ascorbic acid.

Potato cubes stored at 0°C recorded lowest physiological loss in weight, colour score, spoilage, reducing sugars, total sugars, minimum activity of polyphenol oxidase and highest TSS, titratable acidity, starch and ascorbic acid.

Cube size, polythene gauges and vacuum package improves the quality of potato cubes while their combined use along with chemical treatment and cold storage further increased their efficiency leading to improved shelf life. Thus the potato cubes with 2 cm$^3$ treated with 0.5% citric acid packed in 200 gauge polythene bag with vacuum and stored at 0°C recorded highest shelf life, minimum spoilage and polyphenol oxidase enzyme activity compared to other treatments.
A field experiment was conducted during rabi, 2013-14 to study the “Effect of different combinations of organic manures and supplementation of bio-fertilizers on growth, yield and quality of Onion (Allium cepa L.)” at college farm, College of Horticulture, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad, Andhra Pradesh. The experiment was laid out in randomized block design with three replicates 9 treatments viz., T₁: Farmyard manure (50%) + Vermicompost (50%), T₂: Farmyard manure (50%) + Vermicompost (50%) + Azospirillum and PSB @ 5 kg ha⁻¹ each, T₃: Farmyard manure (50%) + Vermicompost (25%), + Neem cake (25%), T₄: Farmyard manure (50%) + Vermicompost (25%), + Neem cake (25%) + Azospirillum and PSB @ 5 kg ha⁻¹ each, T₅: Poultry manure (50%) + Vermicompost (50%), T₆: Poultry manure (50%) + Vermicompost (50%) + Azospirillum and PSB @ 5 kg ha⁻¹ each, T₇: Poultry manure (50%) + Vermicompost (25%) + Neem cake (25%), T₈: Poultry manure (50%) + Vermicompost (25%) + Neem cake (25%) + Azospirillum and PSB @ 5 kg ha⁻¹ each, and T₉: RDF. The data were recorded on plant height (cm), leaf length (cm), number of leaves plant⁻¹, neck thickness (mm), leaf width (cm), leaf dry weight(g), bulb dry weight (g), bulb diameter (cm), bulb length (cm), bulb shape index, number of scales bulb⁻¹, bulb yield (kg plot⁻¹), number of bulbs kg⁻¹, bulb yield (t ha⁻¹), double bulbs (%), marketable yield (%), physiological loss of weight (%), sprouting of bulbs (%), rotting of bulbs (%), TSS (Brix°), moisture content (%), P & S content (%), NPK&S uptake (kg ha⁻¹) by the crop, available NPK&S (Kg ha⁻¹ & ppm) and microbial count in the soil (CFU g soil⁻¹).

The highest plant height, leaf length, number of leaves, leaf dry weight, bulb dry weight, bulb diameter, bulb length, bulb shape index, number of scales, number of bulbs, bulb yield, TSS, P&S content, moisture content, and NPKS uptake were recorded with farmyard manure (50%) + vermicompost (25%) + neem cake (25%) + Azospirillum and PSB @ 5 kg ha⁻¹ each. Farmyard manure (50%) + vermicompost (25%) + neem cake (25%) recorded lower values for physiological loss of weight, sprouting of bulbs and rotting of bulbs. Poultry manure (50%) + vermicompost (50%) recorded maximum values for post-harvest available soil NPKS. Whereas poultry manure (50%) + vermicompost (50%) + Azospirillum and PSB @ 5 kg ha⁻¹ each recorded maximum values for microbial activity in the soil. However, the higher net returns and BCR were obtained with recommended dose of fertilizers.

The results of the present investigation demonstrated that among different organic manures tried, farmyard manure (50%) + vermicompost (25%) + neem cake (25%) + Azospirillum and PSB @ 5 kg ha⁻¹ each can be considered as the best treatment for obtaining higher growth and bulb yield. Better quality of onion was obtained with farmyard manure (50%) + vermicompost (25%) + neem cake (25%). Under organic cultivation of onion, for obtaining maximum net returns and benefit cost ratio farmyard manure (50%) + vermicompost (50%) + Azospirillum and PSB @ 5 kg ha⁻¹ each may be used as organic source of nutrients.


ABSTRACT

An investigation was under taken to ascertain the “Influence of plant growth regulators and antioxidants on in vitro multiplication of banana cv. Karpurachekkarakeli (AAB)” at Tissue Culture Laboratory, Horticulture Research Station,
Kovvur, West Godavari District of Andhra Pradesh. The experiment was carried out in CRD with factorial concept replicated twice.

Among the plant growth regulators in combination with adenine sulphate studied, maximum number of explants responded (in all initiation phases), minimum days taken for primordial emergence and minimum days taken for side shoot emergence (in all cycles) were recorded in P₁ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm). Number of shoots per cycle was highest in P₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 150 ppm) in C₃, C₄ and C₅ cycles where as P₁ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm) was highest in C₆ cycle. Higher values with shoot length (C₃, C₄, C₅ and C₆ cycles) and number of leaves per shoot (C₄, C₅ and C₆ cycles) were recorded in P₁ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm). In both rooting and primary hardening P₁ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm) were recorded higher values with regards to length of the shoot and number of leaves. However, during secondary hardening no significant differences were observed.

Among two antioxidants studied, A₂ (20 mg/l of ascorbic acid) has shown superiority with regard to all parameters. However, the results were non-significant in secondary hardening.

The interaction between plant growth regulators in combination with adenine sulphate and antioxidants was found to be non-significant in case of number of explants responded and days taken for primordial emergence. However, the days taken for side shoot emergence was early in P₁A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm + ascorbic acid 20 mg/l) combination in all the cycles studied. In number of shoots per cycle, the combination of P₁A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm + ascorbic acid 20 mg/l) resulted in higher values as compared to other combinations in all the cycles. In case of shoot length, the combination of P₁A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm + ascorbic acid 20 mg/l) recorded maximum length in C₃, C₅ and C₆ cycles whereas in C₄ cycle P₃A₂ (MS media with BAP 6 ppm + IAA 0.2 ppm + Adenine sulphate 150 ppm + ascorbic acid 20 mg/l) recorded maximum shoot length. Similarly in number of leaves per shoot, the combination of P₁A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm + ascorbic acid 20 mg/l) recorded highest values in C₄ and C₆ cycles while in C₅ cycle P₃A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 150 ppm + ascorbic acid 20 mg/l) recorded higher value. The shoot length and number of leaves per plantlet in rooting and primary hardening were found to be more in P₁A₂ (MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm + ascorbic acid 20 mg/l) combination. However, in secondary hardening the results were found non-significant.

From the present investigation it was revealed that the combination of MS media with BAP 5.5 ppm + IAA 0.2 ppm + Adenine sulphate 100 ppm along with 20 mg/l of ascorbic acid can be used for getting higher proliferation rate in in vitro multiplication of banana cv. Karpurachekkarakeli.


ABSTRACT
The present study was undertaken with the objective of identifying the best parental genotypes and F\textsubscript{1} cross combinations which will improve fruit yield in snake gourd. Studies on the performance of F\textsubscript{1} hybrids and their parents in snake gourd (*Trichosanthes anguina* L.) for yield and yield attributing characters was carried out during *kharif* 2011 to 2012 at Vegetable Research Station, ARI, Rajendranagar, Hyderabad in a randomized block design with two replications. The data were recorded on nineteen characters and analysed for genetic parameters, heterosis, correlation coefficient and path coefficient.

Data was recorded on nineteen different vegetative and fruit characters *viz.*, vine length, no. of branches per vine, no. of days taken to first male flower appearance, no. of days taken to first female flower appearance, no. of node at which first male flower appeared, no. of node at which first female flower appeared, no. of days to 50% flowering, sex ratio, fruit set %, fruit length, fruit width, fruit girth, fruit weight, flesh thickness, fruit set%, no. of fruits per vine, yield per vine, no. of days to fruit maturity, no. of seeds per fruit and hundred seed weight.

Based on mean performance among the twenty hybrids *viz.*, for fruit characters like fruit length, fruit weight, no. of fruits per vine and fruit yield. The following cross combinations showed the better performance. For fruit length out of twenty F\textsubscript{1} hybrids studied six hybrids *viz.*, TA-2 X Swetha (113.0 cm), IC-212475 X Swetha (89.0 cm), Swetha X TA-6 (79.0 cm), Swetha X TA-1 (71.0 cm), IC-212512 X Swetha (59.0 cm) and Swetha X TA-1 (52.0 cm) were recorded medium length fruits over Swetha (195.0 cm) regarding fruit length. Among twenty hybrids the cross combination IC-212512 X Swetha showed maximum fruit weight and out of twenty hybrids IC-212475 X Swetha recorded highest number no. of fruits per vine and IC-212512 X Swetha recorded maximum fruit yield per vine out of twenty hybrids studied.

Among ten parents studied the parents *viz.*, IC-410146 recorded maximum fruit weight, out of ten parents studied maximum no. of fruits per vine recorded in Swetha followed by TA-6 and for fruit yield per vine among ten parents the parent Swetha recorded highest yield followed by TA-4.

The analysis of genetic parameters was revealed higher genotypic and phenotypic variation is recorded for the characters fruit set % followed by fruit length and high GCV is for no. of seeds per fruit and high PCV is for character fruit length.

High heritability and genetic advance as percent of mean for the characters vine length, fruit weight, flesh thickness fruit length and yield per vine in both parents and F\textsubscript{1} crosses which in turn implies the presence of additive gene effects and suggesting that simple selection might be useful for improving these traits. The analysis of genetic parameters was revealed higher genotypic and phenotypic coefficient of variation, heritability and genetic advance as percent of mean for the characters yield per vine, no. of seeds per fruit, and fruit length in both parents and F\textsubscript{1} crosses which in turn implies the presence of additive gene effects and suggesting that simple selection might be useful for improving these traits.

The magnitude of percentage of heterosis expressed by the hybrids for nineteen characters varied among themselves. The magnitude of heterosis was high for flesh thickness, fruit weight, fruit width and fruit girth, moderate for yield per vine, no. of seeds per fruit, fruit girth, no. of days to 50% flowering, no. of days for first male flower appearance, no. of node at which first male flower appeared, sex ratio and no. of days for first male flower appearance, no. of days to fruit maturity, no. of node at which first female flower appearance and low for vine length and hundred seed weight. The maximum heterosis was expressed by IC-212484 X Swetha and IC-212512 X Swetha over better parent was 114.60 and 46.63 per cent for fruit flesh thickness and fruit weight respectively.
The cross combination IC-212484 X Swetha showed the highest *per se* performance and significant heterobeltiosis for flesh thickness, IC-212512 X Swetha, IC-212475 X Swetha and TA-4 X Swetha had showed high positive and significant heterobeltiosis for fruit weight, fruit width and seeds per fruit respectively. Further, it is evident that in most cases heterosis for yield was associated with heterosis for yield components. The cross combination IC-212484 X Swetha showed the highest heterosis and significant heterobeltiosis for flesh thickness, IC-212512 X Swetha, IC-212475 X Swetha and TA-4 X Swetha had showed high heterosis and heterobeltiosis for fruit weight, fruit width and no. of seeds per fruit respectively.

Character association studies revealed that fruit weight, no. of fruits per vine, fruit girth and fruit length showed positive selection with fruit yield as well, suggesting that selection for these characters would ultimately help to bring considerable improvement in fruit yield.

Path coefficient analysis indicated that fruit girth, fruit length, fruit set % fruit weight and no. of fruits per vine had high positive direct effects on yield. More over the indirect effects of most of the characters through fruit girth, fruit weight and fruits per vine is positive. It is therefore, suggested that importance should be given to these characters in a selection programme for evolving superior lines with genetic potentiality for high fruit yield.

It is concluding that based on mean performance, genetic parameters, heterosis, correlation coefficient and path coefficient analysis results among the ten parents five parents *viz.*, Swetha, TA-2, TA-4, TA-6 and IC-410146. While among twenty F₁ progenies seven *viz.*, IC-212475 X Swetha, IC-410146 X Swetha, IC-212512 X Swetha, IC-212484 X Swetha and TA-2 X Swetha, TA-3 X Swetha and TA-4 X Swetha were considered as best in yield and yield attributing characters. These parents and hybrids must be given priority while formulating selection indices for improving yield in snake gourd.


**ABSTRACT**

A study was conducted during 2013-2014 to know the response of cut rose cv. Taj Mahal to different pruning heights for assess quality, vase life and suitability for dry flower grown under naturally ventilated polyhouse at Horticulture College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. Kadapa district of Andhra Pradesh. Among three experiments, first experiment was laid out in RBD with three replications and eight treatments *viz.*, T1 - Pruning back leaving one leaf on current shoots, T2 - Pruning back leaving two leaves on current shoots, T3 - Pruning back leaving three leaves on current shoots, T4 - Pruning back leaving four leaves on current shoots, T5 - Pruning back to first five leaflet stage on current shoots, T6 - Pruning back leaving six leaves on current shoots, T7 - Pruning back leaving seven leaves on current shoots, T8 - Pruning back to second five leaflet stage on current shoots (control). Second experiment trial was laid out in CRD with three replications and eight treatments *viz.*, T1 - 8 HQC @ 100 ppm, T2 - 8 HQS @ 200 ppm, T3 - AgNO₃ @ 100 ppm, T4 - 4 % Sucrose, T5 - Florissant 10 ml l⁻¹, T6 – Aluminium sulphate @ 200 ppm, T7 - Silver thiosulfate @ 4 ppm, T8 - Citric acid @ 200 ppm.

Third experiment trial was laid out in CRD with three replications and eight treatments *viz.*, T1 - Fine river sand, T2 - Quartz sand, T3 - Saw dust, T4 - Chalk powder, T5 - Sieved cocopeat, T6 - Silica gel, T7 - Borax, T8 - Air drying (control). Among pruning levels tried, pruning back leaving seven leaves on current shoots (T7) found better with regard to early
vegetative bud sprout (3.80 days), days taken to first flower bud appearance (21.66 days) and number of days to harvest (39.79 days) and T1 (Pruning back leaving one leaf on current shoots) took more number of days to bud sprout (6.20 days), first flower bud appearance (26.67 days) and number of days to harvest (46.21 days). T6 (Pruning back leaving six leaves on current shoots) was found promising by producing more number of leaves (17.75), shoot length (58.55 cm), Shoot weight (36.92 g) whereas T1 (Pruning back leaving one leaf on current shoots) registered less number of leaves (11.79), Shoot length (36.31 cm), Shoot weight (23.77 g).

However, T1 (Pruning back leaving one leaf on current shoots) put forth maximum shoot girth (7.25 mm), flower bud diameter (4.11 cm) and T7 (Pruning back leaving seven leaves on current shoots) registered minimum shoot girth (5.39 mm) and flower bud diameter (3.25 cm). More per cent number (2.10) of blind shoots were recorded with T5 (Pruning back to first five leaflet stage on current shoots) and T6 (Pruning back leaving six leaves on current shoots) produced less number (0.85).

Cut roses kept in Aluminium sulphate (200 ppm) registered maximum fresh weight on the 2nd - 3rd day (31.24 g) and minimum fresh weight on 11th - 12th day (16.76 g). The maximum transpiration loss of water was recorded from flowers treated with AI2SO4 (200 ppm) on 3rd - 4th day (33.02 g) and minimum transpiration loss of water (5.84 g) was noticed on 11th - 12th day of the study. The maximum water uptake was recorded from flowers treated with AI2SO4 (200 ppm) on 2nd – 3rd (34.86 g) and minimum water uptake (6.23 g) was noticed on 11th - 12th day of vase life studies. Among all the chemical treatments tried maximum final flower diameter (8.02 cm) and maximum vase life (11.94 days) was observed with AI2SO4 (200 ppm) treated flowers.

Among all the desiccants tried, minimum dry weight was retained in silica gel (2.03 g) treated flower stems and the maximum dry weight (3.31 g) was noticed with quartz sand whereas fresh weight for all the treatments showed a non significant variation and all the treatments are statistically on par with eachother. Higher moisture loss (84.23 %) was noticed with silica gel whereas quartz sand shows less moisture loss (71.97 %). Quick drying of flowers was noticed with silica gel (3.74 days) whereas more number of days required for drying of flowers (12.58 days) with quartz sand. The sensory quality attributes revealed that silica gel found to be the most preferred media in producing quality dry flowers and ranked 1st followed by fine river sand (2nd) and borax (3rd) by registering aggregate sensory scores of 17.8, 16.3 and 15.6 respectively out of 20 scale whereas, least aggregate score was obtained for air dried flowers (7.4).

201) “Effect of different post harvest chemicals and packing on shelf life and quality of acid lime (Citrus aurantifolia Swingle) cv. Balaji at room temperature” – N.Sudheer.

ABSTRACT

The present investigation entitled “Effect of different post harvest chemicals and packing on shelf life and quality of acid lime (Citrus aurantifolia Swingle) cv. Balaji at room temperature” was carried out during the year 2013-14 at Post Harvest Technology Laboratory, Horticultural College and Research Institute, Dr Y.S.R.H.U, Venkataramannagudem, West Godavari district of Andhra Pradesh.

The first experiment includes fruits of acid lime cv. Balaji treated with different post harvest chemicals like GA3, 2, 4-D, CaCl2, NaCl at concentrations of 50, 100 ppm, wet sand and in second experiment includes fruits treated with 2, 4-D and packed in LDPE bags of 100,
200 and 300 gauge thickness with different ventilations of 0.2, 0.4 and 0.6 per cent stored at room temperature condition.

Various physico-chemical parameters like PLW (%), fruit colour (score), juice content (%), peel thickness (mm), spoilage (%), TSS (°Brix), acidity (%), ascorbic acid (mg/100 ml) and reducing sugar (%) were estimated at an interval of three days at room temperature.

Fruits in control treatment registered higher spoilage percentage, higher rate of PLW (%) in both the experiments. All these contributed to lower shelf life.

It was found that there was better retention of quality in terms of acidity, juice content (%) and also lower PLW (%), spoilage (%), TSS, reducing sugars, higher peel thickness (mm) and shelf life in fruits treated with 2, 4-D at 100 ppm stored at room temperature.

Fruits treated with 2, 4-D at 100 ppm and packed in poly bags of 300 gauge with 0.2 per cent ventilation recorded significantly higher acidity, juice content (%), peel thickness (mm), and lower PLW (%), spoilage (%), TSS and reducing sugars (%).

The maximum shelf life of 26.00 days was recorded in fruits treated with 2, 4-D at 100 ppm whereas 35.00 days in fruits treated with 2, 4-D at 100 ppm and packed in 300 gauge poly bags with 0.2 per cent ventilation at room temperature.

202) “Standardization of optimum planting density and transplanting time for growth and curd yield of broccoli (Brassica oleracea var. italica L.)” – D.Thirupal.

ABSTRACT

A field experiment on “Standardization of optimum planting density and transplanting time for growth and curd yield of broccoli (Brassica oleracea var. italica L.)” was carried out at HC&RI, Anantharajupet, Y.S.R district, Andhra Pradesh. The experiment consisted of 12 treatment combinations comprising of four transplanting times viz., 20th November (D1), 10th December (D2), 31st December (D3) and 20th January (D4) and three plant spacing viz., 50 x 30cm (S1), 45 x 45cm (S2) and 60 x 45cm (S3). The experiment was laid out in factorial randomized block design with three replications.

The results indicated that significantly higher growth parameters viz., plant height (43.13cm), plant spread (86.66 cm), number of leaves per plant (27.50 cm), stalk stem diameter (48.10mm), leaf length (33.84cm), width (23.59cm), petiole length (16.38cm) and fresh and dry weight of leaves (808.11g & 93.09g), stem (397.51g & 76.91g ), root (43.22g & 12.0g) and total plant (1.997kg & 0.309kg) and higher yield components like curd weight (834.66g), curd length (21.12cm), curd width (24.87cm), yield per plot (23.64kg), yield per hectare (37.04t), harvest index (41.83%) and higher curd quality components viz., ascorbic acid content (125.50mg 100 g-1) and shelf life at room temperature (3.33days) and 4oC (8.10days) were recorded in December 10th planting (D2). Minimum days to curd initiation (34.22), 50% flowering (36.22) was observed in December 10th planting, whereas least number of days to first (53.08) and final (58.50) harvest and highest chlorophyll content (0.23mg g-1) were observed in January 20th planting (D4). December 10th planting (D2) recorded maximum benefit cost ratio (3.83) compared to all other planting dates.

Among the different spacings, wider spacing of 60 x 45 cm (S3) recorded higher growth components viz., plant spread (84.38cm), number of leaves per plant (26.77), stalk stem diameter (47.58mm), leaf length (33.06cm), width (23.01cm), petiole length (15.90cm) and fresh and dry weight of leaves (793.41g & 91.02g), stem (385.14g & 74.52g), root (38.73g & 10.77g) and total plant (1.986kg & 0.307kg) and higher yield components like curd weight (824.09g), length (18.90cm), width (23.43cm) and maximum curd quality components viz.,
ascorbic acid content (113.52mg 100g-1) and chlorophyll content (0.21mg g-1). Less number of days to curd initiation (36.32), 50% flowering (38.36) and maximum plant height (41.17cm) were recorded from a closer spacing of 50 x 30 cm (S1). The highest benefit cost ratio (3.95) was obtained when broccoli planted at a spacing of 50 x 30 cm.

The treatment combination D2 S1 (December 10th with a spacing of 50 x 30 cm) was found to be maximum plant height (44.16cm) and yield per plot (24.72kg) and yield per hectare (38.62i). The same treatment combination was superior in terms of benefit cost ratio (4.58). D2 S3 (December 10th with a spacing of 60 x 45 cm) recorded highest number of leaves per plant (26.77), curd weight (926.33g), curd length (22.03cm), curd diameter (25.43cm) and harvest index (42.78%), whereas D4S3 (January 20th with a spacing of 60 x 45 cm) recorded high chlorophyll content (0.31mg g-1) in curd.


ABSTRACT

A field experiment was carried out at Horticultural Research Station, Dr. YSRHU, Anantharajupet, Y.S.R. district, Andhra Pradesh, during 2013-2014 to find out the response of zinc and boron sprays on growth, yield and quality of papaya (Carica papaya L.) cv. Red Lady. The experiment consisted of nine treatments viz., T1-Borax at 0.25%, T2-Borax at 0.50%, T3-ZnSO4 at 0.25%, T4-ZnSO4 at 0.50%, T5- Borax at 0.25% + ZnSO4 at 0.25%, T6- Borax at 0.25% + ZnSO4 at 0.50%, T7- Borax at 0.50% + ZnSO4 at 0.25%, T8- Borax at 0.50% + ZnSO4 at 0.50% and T9-Control. The experiment was laid out in a Randomized Block Design with three replications.

The results indicated that significantly higher growth parameters such as plant height (243.33 cm), plant girth (46.20 cm) and number of leaves plant-1 (50.07) at 270 DAP and higher yield components like number of fruits plant-1 (63.53), yield plant-1 (106.73 kg), yield per hectare (240.1 t) were recorded with foliar application of Borax at 0.50% + ZnSO4 at 0.25%. All the levels of zinc and boron did not influence the days to first fruit formation and disease incidence (PRSV), however less number of days were taken to harvest in plants sprayed with Borax at 0.50%.

The fruit characters like fruit weight (1.68 kg), fruit length (23.53 cm), fruit girth (44.84 cm), fruit volume (2675.00 cc), weight of fruit pulp (1460.01 g), pulp thickness (3.53 cm), cavity length (20.93 cm), cavity girth (10.93 cm) and cavity index (23.99 %) were found to be higher in the same treatment. Significantly the highest TSS, total sugars and the lowest titrable acidity (0.123 %) was observed in papaya fruits when the plants were treated with Borax at 0.50% + ZnSO4 at 0.50% as foliar spray. Higher shelf life was observed in papaya fruits when the plants were treated with Borax at 0.50% + ZnSO4 at 0.25% as foliar spray. This treatment combination (Borax at 0.50% + ZnSO4 at 0.25%) was superior in terms of maximum gross returns (4,80,286.8), net returns (3,43,716.6) and benefit-cost ratio (2.50).

204) “Studies on seed germination and subsequent seedling growth of papaya (Carica papaya L.) cv. Pusa Nanha”– Ch.Prathibha.

ABSTRACT
The present investigation entitled “Studies on seed germination and subsequent seedling growth of papaya (Carica papaya L.) cv. Pusa Nanha” was carried out at Horticultural College and Research Institute, Anantharajupet during the year, 2013-14. The experiment was laid out in randomized block design replicated thrice with the objective to study the “Effect of chemical treatments and different growing medias on seed germination and subsequent seedling vigour of papaya (Carica papaya L.) cv. Pusa Nanha.”

The results indicated that maximum root length and root dry weight and the dry weight of the seedlings were recorded in seed treatment with GA3 200 ppm for 24 hrs. Whereas, maximum petiole diameter was observed in seed treatment with GA3 300 ppm for 12 hrs. The early seed germination, maximum germination percentage, germination index, plant height, number of leaves, number of nodes, leaf area, seedling girth, petiole length, shoot dry weight, vigour index, fresh and dry weight of seedling along with the highest cost benefit ratio were recorded in seed treatment with GA3 300 ppm for 24 hrs.

The maximum germination percentage, early seed germination, germination index and leaf area were recorded in substrate combination of FYM + Cocopeat + Vermicompost + Soil + Sand (60% + 10% + 10% + 10% + 10%). Whereas, maximum root length and root dry weight was observed in substrate combination of FYM + Cocopeat + Vermicompost + Soil + Sand (10% + 10% + 60% + 10% + 10%) along with the biofertilizer mixture (Azospirillum, PSB and Fratureuria aurantia).

The maximum plant height, number of leaves, number of nodes, seedling girth, petiole length, petiole diameter, shoot dry weight of seedling, fresh weight of seedling, dry weight of seedling and vigour index with the highest cost benefit ratio was recorded in substrate combination of FYM + Cocopeat + Vermicompost + Soil + Sand (60% + 10% + 10% + 10% + 10%) along with the biofertilizer mixture (Azospirillum, PSB and Fratureuria aurantia).

205) “Effect of levels of nitrogen and potassium on growth and yield of crossandra (Crossandra infundibuliformis L.)” – L.Gowthami.

ABSTRACT

The present investigation entitled “Effect of levels of nitrogen and potassium on growth and yield of crossandra (Crossandra infundibuliformis L.)” was carried out during the kharif season of 2013-2014 at Horticultural College and Research Institute, Venkataramannagudem, West Godavari District of Andhra Pradesh. The study was carried out with 16 different treatments involving different combinations of nitrogen and potassium. The experiment was laid out in a randomized block design (RBD) with factorial concept replicated thrice and data on the effect of different nitrogen and potassium treatments on growth, yield, nutrient uptake and economics were recorded and statistically analyzed.

Different nitrogen levels had the highest values for plant growth parameters with respect to plant height, number of branches, plant spread, number of leaves, leaf area and all these parameters were recorded with the application of 150 kg N ha\(^{-1}\). The yield contributing parameters like spike length, spike girth, floret length, floret girth, number of spikes/plant, number of florets/spike, flower yield (g), weight of 100 flowers (g) were also recorded highest with the nitrogen application of 150 kg N ha\(^{-1}\). The increasing rate of N has increased the nitrogen content in soil and nitrogen uptake in all the plant parts.
The influence of different levels of potassium on plant growth and yield parameters were differed significantly and recorded the maximum values with the application of 60 kg K ha$^{-1}$ and thereafter the values decreases even with the increase in the potassium levels. Different levels of potassium had no significant influence on potassium content in soil.

Among the different interaction effects between nitrogen and potassium, application of 150 kg ha$^{-1}$ of nitrogen and 60 kg ha$^{-1}$ of potassium showed significant influence in most of the growth and yield characters. The gross returns and net returns recorded maximum with application of 150 kg ha$^{-1}$ of nitrogen and 60 kg ha$^{-1}$ of potassium resulting in a maximum benefit-cost ratio of 4.88.

Among the different treatment combinations, it was found that the treatment combination of nitrogen at 150 kg ha$^{-1}$ and potassium at 60 kg ha$^{-1}$ proved to be the best for cultivation of crossandra under coastal Andhra Pradesh.

206) “Studies on the effect of NAA, 4-CPA and boron on growth and yield of green chilli (Capsicum annuum L.) Var. Lam 353 in summer”- P.Kiranmayi.

ABSTRACT

The present investigation entitled “Studies on the effect of NAA, 4-CPA and boron on growth and yield of green chilli (Capsicum annuum L.) Var. Lam 353 in summer” was carried out during summer, 2013 at Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavari District, Andhra Pradesh. The studies were carried out with 16 different treatments involving two growth regulators (NAA and 4-CPA) and micronutrient boron individually and in combinations, at two different concentrations sprayed at 60, 90, 120, 150 and 180 DAS. The experiment was laid out in a randomized block design (RBD) with three replications and data on effect of different growth regulators and micronutrient boron on growth, yield and yield attributes were recorded and statistically analyzed.

With regard to growth characters, the plants sprayed with 20 ppm NAA + 0.05% boron (T$_9$) recorded maximum plant height (83.33 cm), maximum plant spread (137.33 cm), maximum number of primary branches (17.0) and minimum number of days to 50% flowering (63 days) compared to other treatments.

With regard to yield attributes, the chilli plants sprayed with 20 ppm NAA + 0.05% boron (T$_9$) also recorded the highest fruit set percentage (30.33%), maximum number of fruits per plant (124), fruit girth (2.98 cm) and mean fruit weight (2.24 g). It was followed by 20 ppm NAA (T$_2$) in fruit set (28.33%), number of fruits per plant (121), fruit girth (2.92 cm) and mean fruit weight (2.17 g). However, the maximum fruit length was recorded in the plants sprayed with 20 ppm NAA (T$_2$) with 8.43 cm, followed by 20 ppm NAA + 0.05% boron (T$_9$) with 8.31 cm.

The plants sprayed with 20 ppm NAA + 0.05% boron (T$_9$) recorded highest number of seeds per fruit (66.73) and test weight (2.25 g). It was followed by (T$_2$) 20 ppm NAA treatment (63.53 and 2.24 g respectively).

The highest green chilli yield per plant (263.5 g) with an estimated yield of 145.9 q/ ha was observed in the plants sprayed with 20 ppm NAA + 0.05% boron (T$_9$). It was followed by the treatment 20 ppm NAA (T$_2$) with 260.3 g/ plant and 141.69 q/ha respectively and were
found on par with each other and significantly superior to control. While in the control, it was 128.4 g per plant with an estimated yield of 70.98 quintals per hectare.

Maximum amount of ascorbic acid (58.12 mg/100 g) was recorded with combination of 50 ppm 4CPA + 0.1% boron (T₁₄), followed by 25 ppm 4CPA + 0.05% boron (T₁₁) with 57.56 mg/100 g. The plants sprayed with growth regulators (NAA and 4CPA) and micronutrient boron either alone or in combinations recorded higher B : C ratios over the controls. The highest benefit : cost ratio (4.29) was obtained with combination of 20 ppm NAA + 0.05% boron (T₉), followed by 20 ppm NAA (T₂) with 4.21.

ABSTRACT

A field experiment was conducted to estimate the genetic variability and divergence in fenugreek and to carry out correlation and path analysis. Twenty five genotypes were sown in a randomized block design with three replications during rabi 2013-2014 at College of Horticulture, Rajendranagar, Hyderabad. The objective of the experiment was to identify divergent genotypes to be used as donor parents in hybridization programmes. Observations were recorded on 18 quantitative characters.

The analysis of variance revealed significant differences between genotypes indicating presence of sufficient amount of variability in all the characters studied. Wide range of variability was observed for plant height, number of pods per plant, seed yield and harvest index indicating the scope for selection of suitable initial breeding material for further improvement.

On the basis of the mean performance the genotypes L-14, L-15, L-3 and L-17 were identified as promising lines for further crop improvement in fenugreek.

High PCV and GCV were recorded in dry weight of the plant and number of pods per plant indicating the existence of wider genetic variability for these traits in the genotypes under study and showing ample scope for selection of these characters.

High heritability coupled with high genetic advance as per cent of mean was observed in plant height, number of primary branches, fresh weight of the plant, dry weight of the plant at harvest, number of pods per plant, hundred seed weight and harvest index indicating contribution of additive genes in the expression of these traits. Therefore improvement in these characters can be done through direct selection to select better genotypes for fenugreek.

Correlation coefficient analysis indicated significant positive association of seed yield with number of pods per plant, fresh weight of the plant, dry weight of the plant, harvest index and seed yield per plot. Direct selection based on these traits could result in simultaneous improvement of characters and seed yield in fenugreek.

Path coefficient analysis showed that the character, seed yield per plot followed by harvest index, dry weight of the plant, days to 50% flowering, plant height and number of primary branches exhibited high positive direct effect on seed yield. This suggested that direct selection based on these traits will be rewarding for yield improvement.

Based on Mahalanobis D² analysis, fenugreek genotypes were grouped into six clusters with maximum of 17 genotypes in cluster I followed by 4 genotypes in cluster II and cluster III, IV, V and VI having one genotype in each.
Genetic diversity analysis revealed that maximum intra-cluster distance was shown by cluster I and minimum in cluster II. The maximum inter cluster distance was observed between cluster VI and III and minimum between cluster V and III. Therefore, the genotypes belonging to cluster I and clusters VI and III may be undertaken in a hybridization programme for getting good segregants.

In conclusion, superior genotypes viz., L-14, L-15, L-3 and L-17 can be used in breeding programmes through either pureline or mass selection methods or hybridization for the development of superior fenugreek varieties for commercial cultivation. It is emphasized to lay attention on the traits viz., plant height, number of pods per plant, seed yield and harvest index in crop improvement programme of fenugreek in future.

208) “Standardization of guava fruit bar from red pulped variety Lalit”- D.Navya Sri.

ABSTRACT

The present investigation entitled “Standardization of guava fruit bar from red pulped variety Lalit” was carried out in a set of two experiments during 2013-14 at College of Horticulture, Rajendranagar, Hyderabad. The objective of this study was to develop an attractive coloured, nutrient rich and highly palatable fruit bar from red fleshed guava variety.

In the first experiment, the effect of cultivars and concentration of Sodium Benzoate on quality of guava fruit bars was studied. Seven fruit bar recipes were prepared as per FPO specifications using Lalit (red fleshed variety), Lalit-Allahabad Safeda (75:25) blend and compared with Allahabad safeda fruit bar (white pulped variety). The fruit bars were preserved with different concentrations of Sodium Benzoate (100, 150 and 200ppm). The seven samples of fruit bar were dried in solar powered cabinet dehydrator (SDM-50) for 48 hours.

The physico-chemical and organoleptic qualities of the fruit bars were evaluated initially in seven fruit bar recipes. The ‘Lalit’ fruit bar with 150 ppm Sodium benzoate had maximum moisture content, TSS, reducing sugars and Lycopene content while ‘Lalit-Allahabad safeda’ blended bar with 100 ppm Sodium Benzoate had maximum ascorbic acid (64.95 mg 100 g$^{-1}$). Lalit-Allahabad Safeda blended bar had highest overall acceptability followed by ‘Allahabad safeda-Lalit’ blended bars preserved with 150 ppm sodium benzoate. Based on the sensory scores these three fruit bars were selected for storage stability.

In the second experiment, the three best fruit bars recipes with better quality, textural and sensory properties were selected and assessed for storage stability. The bars were kept at two storage temperatures viz., ambient temperatures (27±1°C and 60% RH) and accelerated temperatures (37±1°C and 90% RH) for 90 days.

The moisture content of fruit bars decreased under ambient conditions while they gained weight at accelerated storage temperatures. There was a slight decrease in the concentration of total soluble solids, total sugars, and pH in the fruit bar samples stored at two storage temperatures upto 90 days of storage. With subsequent decrease in total sugars, there was slight increase in the percent of titrable acidity and considerable increase of reducing sugars in three fruit bar recipes during storage.

Among the three bar recipes, ‘Lalit’ bar preserved with 150 ppm Sodium Benzoate retained highest total soluble solids, acidity and total sugars upto 90 days of storage at ambient conditions. Whereas the ‘Lalit-Allahabad safeda’ blended bar retained maximum ascorbic acid content (17.90 mg 100 g$^{-1}$) upto 90days.

Although non-enzymatic browning was very high in ‘Lalit’ fruit bar the Bar retained red colour due to the presence of Lycopene and which might have masked the brown colour or pigments in the fruit bars.

‘Lalit-Allahabad safeda’ blended bar had highest rating for sensory attributes like colour, flavor, taste, texture and overall acceptability after 90 days of ambient storage.
The fruit bars stored at ambient temperatures with 60% RH had highest percentage of nutrient retention and no microbial count up to 3 months of storage period. At accelerated temperature, the microbial count was observed from 60\textsuperscript{th} day of storage and increased with increase in storage period, however the products were found safe for consumption.

It can be inferred from the study that, though plain bar of ‘Lalit’ were nutritionally good, based on the sensory evaluation scores the blended fruit bar of ‘Lalit-Allahabad safeda’ was rated as the best.

Thus by blending nutritionally and lycopene rich ‘Lalit’ variety with ‘Allahabad safeda’ a fruit bar superior in appearance, colour, texture, taste and flavor was prepared which has more acceptability than the plain bars of ‘Lalit’ and ‘Allahabad Safeda’.

This study highlighted the feasibility of blending red and white pulped guava varieties in preparation of novel fruit bar which is nutritionally rich and superior in quality attributes.


\textbf{ABSTRACT}

The present investigation entitled “Effect of dates of planting and nitrogen on growth and yield of cabbage (\textit{Brassica oleracea var. capitata. L.})” was carried out in late kharif 2013-2014 at Horticultural College and Research Institute, Venkataramannagudem, Dr.Y.S.R.Horticultural University, West Godavari (Dist.), Andhra Pradesh.

Present study included 16 treatments each replicated thrice in Factorial Randomized Block Design. The treatments included four levels of planting dates (15\textsuperscript{th} August, 1\textsuperscript{st} September, 15\textsuperscript{th} September, 1\textsuperscript{st} October) and four levels of nitrogen (100 kg ha\textsuperscript{-1}, 200 kg ha\textsuperscript{-1},300 kg ha\textsuperscript{-1},400 kg ha\textsuperscript{-1}).

Different dates of planting showed significant influence on vegetative parameters. The growth parameters like plant height, number of leaves per plant and leaf area at all growth stages were maximum with the crop planted on 15\textsuperscript{th} September (D\textsubscript{3}). The number of days taken to initiation of head, days to harvest and percentage of abnormal heads were found to be minimum with 15\textsuperscript{th} September planting (D\textsubscript{3}). Similarly crop planted on 15\textsuperscript{th} September (D\textsubscript{3}) recorded the highest head circumference, volume of head, head weight and estimated yield per hectare when compared to all other treatments. Nitrogen uptake by the plant and available soil potassium were found to be highest with the crop planted on 15\textsuperscript{th} September (D\textsubscript{3}) and available soil nitrogen was found to be highest with 1\textsuperscript{st} October planting (D\textsubscript{4}). However, dates of planting had no significant influence on available soil phosphorus.

Different nitrogen levels had shown significant influence on vegetative parameters. All the growth parameters like plant height, number of leaves per plant, leaf area and plant spread at different growth stages \textit{viz.}, 30DAT, 60 DAT and at harvest recorded highest values with application of nitrogen @ 300 kg ha\textsuperscript{-1} (N\textsubscript{3}). The number of days taken to initiation of head, days to harvest and percentage of abnormal heads were found to be minimum with application of nitrogen @ 300 kg ha\textsuperscript{-1} (N\textsubscript{3}). Similarly the crop applied with 300 kg N ha\textsuperscript{-1} (N\textsubscript{3}) recorded the highest head circumference, volume of head, head weight and estimated yield per hectare. Nitrogen uptake by the plant and available soil nitrogen content were found better with nitrogen application @ 300 kg ha\textsuperscript{-1}. However, available soil potassium content was highest with application of nitrogen @ 400 kg ha\textsuperscript{-1}(N\textsubscript{4}). The effect of different nitrogen levels on available soil phosphorus was found non-significant.
The interaction effect of dates of planting and nitrogen was found non-significant on vegetative characters. But it had significant influence on yield and yield attributing characters. Among all the treatments, combination of 15\textsuperscript{th} September planting with an application of nitrogen @ 300 kg ha\(^{-1}\) (D\(_3\)N\(_3\)) recorded the highest volume of head, head weight and estimated yield per hectare.

Similarly the crop planted on 15\textsuperscript{th} September with an application of nitrogen @ 300 kg N ha\(^{-1}\) (D\(_3\)N\(_3\)) recorded highest available soil potassium content. Highest benefit cost ratio was also recorded with the same combination. Hence the combination of 15\textsuperscript{th} September planting with an application of nitrogen @ 300 kg ha\(^{-1}\) (D\(_3\)N\(_3\)) may be recommended to get higher yields and quality heads of cabbage in coastal Andhra Pradesh.


**ABSTRACT**

The present investigation entitled “Effect of nitrogen and potassium on growth and yield of taro (Colocasia esculentum var. antiquorum) cv. KCS-3” was carried out during the kharif season of 2013-2014 at Horticultural College and Research Institute, Venkataramannagudem, West Godavari District of Andhra Pradesh. The study was carried out with 16 different treatments involving different combinations of nitrogen and potassium. The experiment was laid out in a randomized block design (RBD) with factorial concept replicated thrice and data on the effect of different nitrogen and potassium treatments on growth, yield, nutrient uptake and economics were recorded and statistically analyzed.

Different nitrogen levels had significant influence on the plant growth parameters with respect to plant height, plant spread, number of leaves, leaf lamina length, leaf lamina width, number of tillers, girth of pseudostem, petiole length and petiole breadth and highest values for all these parameters were recorded with the application of 120 kg N ha\(^{-1}\). The yield contributing parameters like corm length, corm girth, cormel length, cormel girth, corm yield per plant, number of cormels per plant, cormel yield per plant, estimated cormel yield (q ha\(^{-1}\)) were also recorded highest with the nitrogen application of 120 kg N ha\(^{-1}\). Significant difference was observed due to the effect of different nitrogen levels on quality parameters of taro. Acridity increased with increasing rate of N application. Similarly the increasing rate of N has increased the nitrogen content in soil and nitrogen uptake in all the plant parts.

The influence of different levels of potassium on plant growth and yield parameters were differed significantly and recorded the maximum values with the application of upto 120 kg K ha\(^{-1}\) and thereafter the values decreased even with the increase in the potassium levels.

Among the different interaction effects between nitrogen and potassium application of 120 kg ha\(^{-1}\) of nitrogen and 120 kg ha\(^{-1}\) of potassium showed non significant influence in most of the growth and yield characters viz., leaf lamina length, leaf lamina width, petiole length, petiole breadth, leaf lamina length / width ratio, corm length and girth, cormel length and girth and phosphorus uptake by the plant. However, corm yield per plant, number of cormels per plant and cormel yield differed significantly. The acridity of cormels increased with increase in levels of nitrogen and potassium. However, the differences were non-significant. The gross returns and net returns recorded maximum with application of 120 kg ha\(^{-1}\) of nitrogen and 120 kg ha\(^{-1}\) of potassium resulting in a maximum benefit-cost ratio of 3.5.

Among the different treatment combinations, it was found that the treatment combination of nitrogen at 120 kg ha\(^{-1}\) and potassium at 120 kg ha\(^{-1}\) proved to be the best for cultivation of taro under light soils of coastal Andhra Pradesh.
211) “Studies on influence of denavelling and stalk end application of nutrients on yield and quality of banana cv. Dwarf Cavendish” – I Priyanka.

ABSTRACT

An experiment was carried out to ascertain the “Studies on influence of denavelling and stalk end application of nutrients on yield and quality of banana cv. Dwarf Cavendish” at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh. The experiment was carried out in randomized block design (RBD) replicated thrice, with eleven treatments and the data on the effect of denavelling and stalk end application of nutrients on yield and quality were recorded and statistically analyzed.

The treatments were imposed by excision of male bud i.e. 5-7 days after opening of the last hand in the bunch and immersing the rachis / stalk into the plastic bag containing different treatments of cow dung slurry.

The treatment consisted of fresh cow dung (500 g), water 250 ml and a combination of different concentrations of AS (10 g & 20 g), SOP (10 g & 20 g), KNO$_3$ (10 g & 20 g) and KH$_2$PO$_4$ (10 g & 20 g).

The results revealed that denavelling of bunches improved yield irrespective of treatments. The bunch characters in terms of bunch yield (73.10 t / ha), bunch weight (20.57 kg), weight of the hand (2.60 kg), weight of the finger (127.66 g) was observed maximum in denavelled bunch treated with combination of 500 g of fresh cow dung slurry with 20 g of SOP (T$_7$) as compared to control.

Finger parameters of the bunch like finger length (18.43 cm), finger circumference (12.90 cm), weight of the pulp (109.16 g), weight of the peel (42.31 g) was observed maximum in denavelled bunch treated with combination of 500 g of fresh cow dung slurry with 20 g of SOP as compared to control.

Quality parameters of the bunch were also influenced markedly. Highest T.S.S. (17.16 °Brix), reducing sugar (8.23 %), total sugar (17.10 %), ascorbic acid (6.60 mg / 100 g) and sugar to acid ratio (68.4) were increased by a treatment combination of fresh cow dung slurry 500 g and SOP 20 g. Other treatment combinations also showed improvements in bunch weight and quality parameters as compared to the control.

Post harvest parameters of the bunch like PLW (10.60 %), days to ripening (5.50 days) and shelf life (7.56 days) observed maximum in T$_7$ (denavelled bunch treated with combination of 500 g of fresh cow dung slurry with 20 g of SOP) as compared to control.

From the present investigation, it was found that the treatment imposed to the denavelled bunch with the combination of fresh cow dung slurry 500 g and SOP 20 g, proved to be best for yield and quality improvement in banana cv. Dwarf Cavendish.


ABSTRACT

The present investigation entitled “Studies on the effect of post-harvest treatments and floral preservatives on extension of vase life of cut gerbera (Gerbera jamesonii Bolus ex. Hook.) cv. Savannah” was carried out in the Department of Floriculture and Landscape Architecture Laboratory, College of Horticulture, Mojerla during year 2013-14.
A total set of five experiments were carried out to evaluate the effect of precooling and pulsing, locally available preservatives, essential oils, antioxidants and mineral salts and their combination treatments under ambient condition and at 5°C on different parameters viz., physical (scape bending curvature, ligule wilting percentage and percentage of spoilage of flowers and physiological (water uptake, transpirational loss of water, fresh weight change) at an interval of 2 days whereas biochemical parameters (total soluble solids, pH, anthocyanin content, optical density) at an interval of 3 days and microbial count (initial and final) also recorded during vase life period of cut gerberas.

All the experiments were laid out in a completely randomized design with factorial concept and replicated thrice. In all five experiments, the flowers were held in the test treatment solutions at ambient room temperature and at 5°C till the end of vase life period.

Among the precooling and pulsing treatments, precooling for six hours followed by pulsing for twelve hours with sucrose at 20% and sodium hypochlorite at 50 ppm kept in vase solution (4% sucrose + 25 ppm NaOCl) recorded best results for almost all the parameters studied and resulted in higher vase life of 9.46 days in cut gerbera cv. Savannah compared to control (4.54 days).

The other holding experiments with locally available preservatives, essential oils, antioxidants and mineral salts were evaluated through precooling for six hours followed by pulsing for twelve hours with sucrose at 20% and sodium hypochlorite at 50 ppm in both conditions i.e. ambient and at 5°C. Among different treatments tried, neem extract at 1%, rosemary oil at 5% and calcium chloride at 0.1% significantly increased the vase life in cut gerbera cv. Savannah compared to control in ambient and also at 5°C due to their antimicrobial activity and maintenance of positive water relations.

The best treatments of each holding solutions were studied in combination under ambient condition and at 5°C. Under ambient condition, among all the treatments, neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% recorded maximum vase life (13.37 days) whereas control recorded lowest vase life of 4.71 days. Due to antimicrobial activity of both neem extract and calcium chloride resulted in better maintenance of water relations with highest water uptake (10.17 g), fresh weight change (96.65 %) in neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% and also lowest microbial count was recorded (3.42 x 10^5 cfu/ml) which is attributed with lowest optical density i.e. (0.046) whereas control recorded highest microbial count (9.22 x 10^6 cfu/ml). Scape bending curvature was also low (3.17 degrees) due to turgidity of scapes which led to lowest ligule wilting percentage (12.20 %) and percentage of spoilage of flowers (9.10 %) respectively. Further, neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% recorded highest anthocyanin content of ligules (6.66 mg Congo Red/g f wt) and also highest TSS content in flower stalk (10.13 °Brix) over control.

At 5°C, among all the treatments, neem extract at 1% + calcium chloride at 0.1% + sucrose 4% recorded maximum vase life of 32.32 days and lowest vase life of 18.43 days was recorded in control. The treatment neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% showed highest water uptake (5.74 g) due to antimicrobial activity of both neem extract and calcium chloride resulted in maintenance of prolonged water relations due to slower metabolic activity with reduced respiration rate at 5°C. Scape bending was also low (3.29 degrees) due to higher water uptake and turgidity of scapes. The treatment neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% recorded highest TSS content (10.46 °Brix) and anthocyanin content of ligules (6.69 mg Congo Red/g f wt) respectively. Further, neem extract at 1% +
calcium chloride at 0.1% + sucrose at 4% registered lowest microbial count \((3.12 \times 10^5 \text{ cfu/ml})\) which is attributed with lowest optical density (0.041) whereas control recorded highest microbial count \((8.68 \times 10^6 \text{ cfu/ml})\).

Among the vase solutions studied, the treatment neem extract at 1% + calcium chloride at 0.1% + sucrose at 4% recorded highest benefit cost ratio in both conditions of storage i.e. ambient condition (1:2) and at 5°C (1:6).


ABSTRACT

Two field experiments were conducted to study the effect of spacing, pinching and plant bio regulators on growth, flowering and seed yield in China aster cv. Kamini at College farm, College of Horticulture, Rajendranagar, Hyderabad during the 2013-14. The closer spacing of 30 x 15 cm (S1) recorded significantly higher plant height at 90 DAT (54.08 cm), minimum days to first flowering (82.30) and 50% flowering (100.42), maximum flower stalk length (37.18 cm), number of flowers per plot (3684.37), flower yield per plot (4.66 kg), flower yield per hectare (14.38 t), seed yield per plot (649.12 g) and seed yield per hectare (2003.46 kg). While wider spacing of 45 x 30 cm (S3) recorded more number of primary branches per plant (27.51), number of secondary branches per plant (72.47) and plant spread (44.84 cm), maximum flower diameter (6.20 cm), number of flowers per plant (65.88), flower yield per plant (70.56 g) and seed yield per plant (12.40 g). Significantly higher plant height at 90 DAT (55.87 cm) was recorded in unpinched plants, while plants pinched at 20 DAT recorded significantly higher number of primary branches per plant (26.62), number of secondary branches per plant (71.83), plant spread (44.52 cm), flower stalk length (36.83 cm), number of flowers per plant (70.47), number of flowers per plot (3760.86), flower yield per plant (73.46 g), flower yield per plot (4.01 kg) and flower yield per hectare (12.38 t), seed yield per plant (13.07 g) seed yield per plot (684.02 g) and seed yield per ha (2161.58 kg) when compared to other pinching treatments (30 and 40 DAT).

Among the growth regulators, GA3 200 ppm spray recorded significantly higher plant height at 90 DAT (60.10 cm), number of primary branches per plant (24.60), number of secondary branches per plant (61.45), number of flowers per plant (84.96), flower yield per plant (109.66 g), flower yield per hectare (16.58 t), seed yield per plant (9.98 g), seed yield per ha (1509.31kg) and 1000 seed weight (2.01g). GA3 200 ppm foliar spray was found to be on par with SA 200 ppm in respect of number of primary branches (23.86), flower yield per hectare (15.90 t), seed yield per plant (9.85 g) and seed yield per hectare (1489.65 kg). On the basis of present research findings it could be concluded that for obtaining higher flower and seed yield per hectare in China aster cv. Kamini planting at a closer spacing of 30x15 cm and pinching at 20 DAT could be recommended.

Salicylic acid 200 ppm foliar spray at 20 and 35 DAT could be recommended for increased growth, flower and seed yield in China aster cv. Kamini as it is more cheaper than GA3.

214) “Studies on improvement of shelf life of custard apple (\(Annona\) squamosa L.) cv. balanagar and hybrid x atemoya balanagar stored at low temperature”.- G. Shailaja.
ABSTRACT

A set of six experiments on the effect of MAP (Polypropylene bags with different number on pores), hot water treatments (45°C, 50°C and 55°C for 5, 10, 15 minutes and 20 minutes) and combination of MAP (first two best of MAP) and hot water treatments (first two best of hot water treatments) on shelf life of custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar stored at low temperature(13°C±1), was conducted at Fruit Research Station, Sangareddy, Dr YSRHU, A. P. The MAP and hot water treatment experiments has design with completely randomized design with factorial concept with three replications per treatment and the combination experiments have five replications per treatment. Various physical parameters like PLW (%), Firmness (kg cm⁻²), Spoilage (%), Ripening (%) and biochemical parameters like TSS (°Brix), Acidity (%), Brix-acid ratio, Sugars (%) and Ascorbic acid (mg/100 g) were estimated at an interval of 4 days during storage in all the experiments.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were packed in polypropylene bags with different number of pores and stored at low temperatures(13°C±1). In Balanagar polypropylene bags with 20 pores recorded significantly lower PLW than control fruits. Significantly the highest firmness was recorded in fruits packed in polypropylene bags with 20 pores. Maximum ripening was recorded in fruits packed in polypropylene bags either with 20 pores. Polypropylene bags with 20 pores recorded significantly lower spoilage. Fruits packed in polypropylene bags with 20 pores were superior for appearance and overall acceptability. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) were significantly lower in fruits packed in polypropylene bags with 20 pores than control fruits indicating delayed ripening. Significantly the highest acidity was recorded in fruits packed in polypropylene bags with 20 pores. Significantly the lowest non-reducing sugars and highest ascorbic acid were recorded in fruits packed in polypropylene bags with 20 pores. In Atemoya X Balanagar polypropylene bags with 20 pores recorded significantly lower PLW than control fruits. Significantly the highest firmness was recorded in fruits packed in polypropylene bags with 20 pores. Maximum ripening was recorded in fruits packed in polypropylene bags with 20 pores. Polypropylene bags with 20 pores recorded significantly lower spoilage. Fruits packed in polypropylene bags with 20 pores were superior for appearance and overall acceptability. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) were significantly lower in fruits packed in polypropylene bags with 20 pores than control fruits indicating delayed ripening. Significantly the highest acidity was recorded in fruits packed in polypropylene bags with 20 pores. Significantly the lowest non-reducing sugars and highest ascorbic acid were recorded in fruits packed in polypropylene bags with 20 pores.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were treated with hot water and stored at low temperature(13°C±1). In Balanagar Fruits treated with 50°C for 10 minutes recorded significantly lowest PLW than control fruits. Significantly highest firmness was recorded in fruits treated with 50°C for 10 minutes. Fruits treated with50°C for 10 minutes were superior for appearance and overall acceptability. Fruits treated 50°C for 10 minutes recorded significantly lower spoilage. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) were recorded the lowest and ascorbic acid recorded the highest in fruits treated with 50°C for 10 minutes. The hot water treated fruits recorded significantly the highest acidity and the lowest non-reducing sugars. In Atemoya X Balanagar Fruits treated with 50°C for 10 minutes recorded significantly lowest PLW than control fruits. Significantly highest firmness was recorded in fruits treated with 50°C for 10 minutes. Fruits treated
with $50^\circ$C for 10 minutes were superior for appearance and overall acceptability. Fruits treated $50^\circ$C for 10 minutes recorded significantly lower spoilage. Biochemical parameters like TSS, brix-acid ratio and sugars (reducing and total) was recorded the lowest and ascorbic acid recorded the highest in fruits treated with $50^\circ$C for 10 minutes. The hot water treated fruits recorded significantly the highest acidity and the lowest non-reducing sugars.

Custard apple fruits cv. Balanagar and hybrid Atemoya X Balanagar were treated with hot water and packed in two best treatments of MAP (pores) and stored at low temperature (13ºC±1). In Balanagar Fruits treated with benzyl adenine 100 ppm and then packing in polypropylene bags with 3% O$_2$ + 5% CO$_2$ recorded significantly lowest PLW and highest firmness than control fruits. Fruits treated with benzyl adenine 100 ppm and then packed in polypropylene bags with air were superior for appearance and overall acceptability. Fruits treated either with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm and then packed in polypropylene bags with air recorded significantly lowest spoilage and maximum days taken for ripening and correspondingly increase the shelf life upto 13.33 days. The control fruits recorded a shelf life of 8.9 days only. Biochemical parameters like TSS, brix-acid ratio and reducing sugars were recorded the lowest and ascorbic acid recorded the highest in fruits treated either with benzyl adenine 100 ppm or sodium benzoate 500 ppm or ascorbic acid 1000 ppm and then packed in polypropylene bags with 3% O$_2$ + 5% CO$_2$. Significantly lowest non-reducing sugars, total sugars and highest acidity were recorded in treated fruits irrespective of antioxidants and then packed in polypropylene bags with 3% O$_2$ + 5% CO$_2$ or air. The combination of MAP and antioxidants enhanced the shelf life of 1.33 and 2.83 days over the MAP or antioxidants used alone, respectively.

215) “Studies on the effect of different rootstocks on growth, yield, raisin recovery and quality of commercial grape varieties”- B. Nithya Menora.

ABSTRACT

The present investigation entitled “STUDIES ON THE EFFECT OF DIFFERENT ROOTSTOCKS ON GROWTH, YIELD, RAISIN RECOVERY AND QUALITY OF COMMERCIAL GRAPE VARIETIES” was carried out at Grape Research Station, Dr. Y. S. R Horticultural University, Rajendranagar, Hyderabad during October 2013 to April 2014. The objectives of the experiment were to study the effect of different rootstocks on growth, yield and other objective is to study the effect of different rootstocks on raisin recovery and quality of three commercial grape varieties.

The experiment was carried out with three rootstocks (1103 P, SO 4 and Dogridge) and three varieties (Thompson Seedless, Flame Seedless and Kishmish Chorni) with own roots as control in Factorial Randomized Block Design replicated four times. The observations were recorded, analysed and the final results are shown below.

Among the rootstocks, varieties grafted on Dogridge rootstock recorded maximum pruning weight, cane diameter, number of bunches per vine, mean bunch weight, number of berries per bunch, 100 berry weight, berry diameter, yield and heat unit requirement. Own rooted vines recorded maximum number of fruitful canes per vine and found to be early in terms of number of days taken for bud break, period of anthesis, period of fruitset, period of ripening, and less heat unit requirement.
Among the varieties, Thompson Seedless was found to be more vigorous while Kishmish Chorni recorded maximum number of fruitful canes, bunches and high yields per vine and took more number of days for anthesis, fruitset and ripening.

From the second objective, among the rootstocks, the titrable acidity was low and total soluble sugars, total sugars and reducing sugars were high with scions grafted on Dogridge and recovery of raisins, ascorbic acid of the raisins were also high on Dogridge rootstock. Average weight of raisins, non-reducing sugars in both fresh berries and raisins were high in own rooted than the grafted ones. Scions grafted on 1103 P recorded more moisture percentage.

Among the varieties, in both fresh berries and raisins, total soluble sugars, total sugars, reducing sugars, recovery of raisins and ascorbic acid were high in Thompson Seedless. Kishmish Chorni recorded more acidity with respect to fresh berries as well as raisins. Flame Seedless recorded high average weight of raisins, more moisture percentage, and non-reducing sugars.

In organoleptic evaluation, colour and appearance, flavour, taste and overall acceptability were more on scions grafted on 1103 P and texture on dogridge rootstock. Among the varieties, Thompson seedless recorded more score with respect to colour and appearance, taste, texture and overall acceptability while Flame Seedless raisins gained more score for flavour.


ABSTRACT

The present investigation “Evaluation of gladiolus cultivars under open field conditions for growth, yield and vase life in Southern zone of Andhra Pradesh” was conducted during the period from September 2013 to March 2014 at Horticulture College and Research Institute, Dr.Y.S.R. Horticultural University, Anantharajupet, Y.S.R District of Andhra Pradesh.

The experiment was laid out in RBD with three replications and fourteen treatments (Ac No.7, American Beauty, Arun, Arka, Amar, Arka Gold, Arka Naveen, Bindya, Darshan, Dhiraj, Sadabahar, Suchitra, Swarnima, Sylvia, Tilak). The spacing adopted was 0.3m x0.2m.

The results on vegetative parameters revealed the maximum plant height at spike emergence and spike harvest was observed in the cultivars Bindya (80.27, 110.33 cm) and Swarnima (75.20, 106.20 cm) respectively. Maximum number of leaves plant\(^{-1}\), leaf length and leaf width was recorded in cv. Bindya (9.46, 58.33cm, 3.79 cm) respectively.

Significant variations were observed for floral characters, among all cultivars, cv. Bindya (52.20, 56.13, 59.67, 63.67 days), Ac. NO.7 (54.73, 58.53, 61.00, 63.80 dyas) and Swarnima (55.53, 60.67, 63.67, 67.73 days) were found early to spike initiation, full emergence of spike, first floret to show colour and first floret to open respectively. The cultivars Swarnima (90.60,54.47 cm) recorded maximum spike length and rachis length. Cultivars Swarnima (13.40) and Arka Amaf (13.00) also produced more number of florets spike\(^{-1}\). Maximum diameter of first floret was noticed in cultivar Arka Gold (12.37 cm) and Bindya (12.27 cm.)

Maximum vase life period and longevity of spike on plant was observed in cultivar Arka Gold (12.03, 16.40 days).
With regard to corm parameters maximum number of corms plant$^{-1}$ was recorded in cultivar American Beauty (2.60) and Arka Amar (2.47) where as cultivar Arka Amar (43.33) produced more number of cormels plant$^{-1}$ followed by American Beauty (28.20). The maximum weight of corms Plant$^{-1}$ and diameter of corm was observed in cv. Bindya (126.13 g, 7.71 cm respectively). The weight of cormels was highest in cultivar Syvia (40.69 g) and Arka Amar (38.45 g).


**ABSTRACT**

The present experiment entitled “Studies on the effect of IBA and rooting media on rhizogenesis of cuttings of pomegranate (*Punica granatum* L.) cv. Bhagwa under shade net conditions” was carried out during 2013-2014 at College Farm, Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The present experiment was conducted to study the effect of five rooting media namely Vermiculite, Red Earth + FYM (1:1), Black clay + FYM(1:1), Sand + FYM (1:1), Coir pith + FYM (1:1) and two IBA concentrations i.e., 2000 ppm and 4000 ppm with ten treatment combinations and three replications in Factorial Randomised Block Design under shadenet condition on root and shoot parameters and establishment of rooted cuttings in the main field.

The study revealed that significant differences were existed among rooting media for different rooting and shooting parameters. Among the five rooting media studied, mixture of coir pith and FYM performed superior in almost all parameters except days to first sprouting. The number of days taken for first sprouting was highest in cuttings grown in a mixture of black clay and FYM. There was no significant differences among the rooting media for total leaf chlorophyll content per cutting. This result showed that mixture of coir pith and FYM was found to be elite for different characters studied during propagation. The performance of the cuttings grown in vermiculite was inferior.

Of the two concentrations of IBA, 4000 ppm IBA recorded minimum number of days to first sprouting, maximum rooting and shooting parameters viz., percentage of rooted cuttings, survival percentage of rooted cuttings, average number of roots, length of longest root, fresh and dry weights of roots, fresh and dry weights of shoots number of days taken for first sprouting, total leaf chlorophyll content per cutting at 90 DAP, number of shoots, number of leaves, length of longest shoot per cutting at 30, 60 and 90 DAP. The percentage of establishment of rooted cuttings in the main field was also recorded maximum with the same treatment.

The treatment combinations exhibited significant differences with respect to the observations studied. The cuttings treated with IBA 4000 ppm and grown in a mixture of coir pith and FYM recorded significantly superior results in most of the rooting and shooting parameters except number of days taken for first sprouting. The number of days taken for first sprouting was found to be minimum in cuttings treated with IBA 4000 ppm and grown in a mixture of black clay and FYM, while maximum in cuttings treated with IBA 2000 ppm and grown in vermiculite. There was no significant interaction between rooting media and IBA concentrations for total leaf chlorophyll content per cutting. The least performance was found
in cuttings treated with IBA 2000 ppm and grown in vermiculite for most of the rooting and shooting parameters.

From the present investigation it can be concluded that the cuttings treated with IBA 4000 ppm and grown in a mixture of coir pith and FYM gave pronounced effect on root and shoot formation indicating its eliteness for propagation in pomegranate under shade net conditions.

218) “Studies on Improvement of Seed Germination and Season of Wedge Grafting in Guava (Psidium guajava L.)” – D. Muntaj.

ABSTRACT

An experiment was conducted to evaluate the effect of different presowing seed treatments on germination and to find out the best season for performing wedge grafting in guava at Horticulture College and Research Institute, Anantharajupet during the year 2013-2014. The investigation was organised into two experiments, first one on different seed treatments versus germination as well as seedling growth and the second one on different months (July to January) of performing wedge grafting versus success of it in guava. The first experiment was conducted on guava cv. Lucknow 49 since it is popular as promising rootstock whereas, the second experiment was conducted on the scions of guava cv. Allahabad Safeda since it is a commercial cultivar.

Among the different seed treatments, soaking in GA3 3000 ppm for 24 hours resulted in significantly higher (74.00%) seed germination, co-efficient of germination velocity (3.10), shoot length (21.47 cm), seedling girth (0.93 cm), vigour index (2715.43), maximum number of leaves per seedling (19.22), leaf area (18.32 cm2), fresh weight (6.62 g) and dry weight (3.15 g) of seedlings. Whereas the minimum days (10.33 days) for initiation of germination was observed by soaking in GA3 2000 ppm solution for 24 hours. All concentrations of GA3 recorded better seedling growth significantly superior to other treatments.

Season of grafting was found to exert significant influence on success of wedge grafting in guava. Maximum per cent of graft take (74.00%) was recorded by the grafts prepared during the month of July followed by September (66.45%). Minimum days taken for scion sprouting (6.33 days) was recorded in the month of July followed by August and September (7.33 days). Maximum sprout length (4.04 cm), number of leaves per graft (15.33), leaf area (23.86 cm2) and graft diameter (5.10 mm) was recorded in the month of July at 60 days after grafting. Though the maximum number of sprouts per graft (2.73) and graft height (13.82 cm) was observed in grafts prepared during the month of September at 60 days after grafting September grafted material was relatively poorer in graft take (66.45%) as compared to July grafted material in guava cv. Allahabad Safeda under Anantarajupeta conditions.


ABSTRACT

The present investigation entitled “Studies on the effect of 1-Methylcyclopropene (1-MCP) on the shelf life and quality of banana cv.Grand naine” was carried out during the year
The first experiment includes fruits of banana cv. Grand Naine treated with 1-Methylcyclopropene (1-MCP) at concentrations of 250 ppb, 500 ppb and 750 ppb, for three different times of exposure – 6 h, 12 h and 24 h and stored under ambient conditions (27 ± 1°C) and the second experiment includes fruits treated with 1-Methylcyclopropene (1-MCP) at concentrations of 250 ppb, 500 ppb and 750 ppb exposing the fruits for 6 h, 12 h and 24 h and stored under cold storage conditions (13°C ±1).

Various physico-chemical parameters like PLW (%), peel colour (score), fruit firmness (kg/cm²), pulp to peel ratio, ascorbic acid content (mg/100g), TSS (°Brix), acidity (%), reducing sugars (%), total sugars (%), ethylene evolution rate (µl/kg/hr) and total phenol content (mg /100g) were estimated at an interval of 3 days under ambient conditions and at an interval of 5 days under cold storage conditions.

Fruits under control treatment registered higher rate of PLW (%), higher peel colour score, pulp to peel ratio, lesser fruit firmness, in both the experiments and all these lead to lower shelf life of control fruit.

It was found that there was better retention of quality in terms peel colour, fruit firmness, low acidity, low pulp to peel ratio and also lower PLW (%), TSS, reducing sugars, total sugars, ethylene evolution rate and higher shelf life in fruits treated with 1-MCP at 750 ppb for 24 h under ambient conditions.

The fruits treated with 1-MCP at 750 ppb for 24 h under cold storage conditions, the peel colour, fruit firmness, were retained better than that in ambient conditions. The decrease in the PLW %, pulp to peel ratio, acidity, lower ethylene evolution rate, low TSS, reducing and total sugars % and higher ascorbic acid content also have been recorded better than that in the ambient conditions.

The maximum shelf life of 30 days was recorded in fruits treated with 1-MCP at 750 ppb for 24 h under ambient conditions whereas 55 days in fruits treated with 1-MCP at 750 ppb for 24 h under cold storage conditions.

From the present experiment it can be concluded that treatment with 1-MCP at 750 ppb for 24 h is found to be efficient in improving the quality and shelf life of banana cv. Grand Naine under both ambient and cold storage conditions.

“Evaluation of cucumber (Cucumis sativus L.) hybrids for production potential and qualitative traits under net house conditions” – K. Pragathi.

ABSTRACT

A study was conducted to evaluate different cucumber hybrids for growth, yield and quality traits under 50% shade net during the period from October, 2013 to January, 2014 at Horticultural College and Research Institute, Dr.Y.S.R. Horticultural University, Anantharajupet, Y.S.R. Distirct of Andhra Pradesh. The experiment was laid out in RBD with three replications and nine treatments (hybrids) viz., Don, Encounter-692, INdam swadishkareena, Maharaj, Multi-stat, Sedona, Silyon and VAhini under 50% white shade net house of 10,0000 m². The spacing adopted was 60 cm x 60 cm.
The results on growth parameters revealed that, minimum internodal length of vine (7.17 cm), maximum diameter of the stem (1.11 cm), maximum leaf length (31.20 cm) and leaf width (33.42 cm) were observed in the hybrid Multi-Star where as the highest petiole length was noticed in the hybrid Sedona (23.71 cm).

The data on reproductive parameters indicated that number of days taken for flower appearance fro hybrids was ranged between 29.07 to 35.80 days. Hyrbrid Multi-Star found best by recording less number of days (29.07) with more number of flowers (115.87), less number of days taken for fruit set (2.28 days) and minimum time taken for first fruit picking (39.87 days). However other hybrids performed differently. The maximum per cent of fruit set (80.43%) was recored in Kareena.

With regard to fruit characteristics, higher fruit length (25.55 cm), fruit diameter (5.50 cm), fruit volume (452.67 cm$^3$) were recored in the hybrid, Don and maximum fruit shape index (5.13) was calculated in the hybrid, Silyon, whereas the hybrid, Maharaja showed maximum fruit stalk length (6.75 cm). The data on yield and yield attributing parameters indicated that number fo fruits vine$^{-1}$ (81.13 and 79.67) and more number of pickings vine$^{-1}$ (23.07 and 22.73) were significantly higher in the hybrids Multi-Stat and Silyon. Maximum mean fruit weight recored in the hybrid, Doln (408.00 g). Multi-Stat and Silyon hybrids expressed their superiority over other hybrids in terms of higher yield (11.35 kg vine$^{-1}$ and 9.15 kg vine$^{-1}$).

Higher ascorbic acid content was recored in the hybrids, Indam-Swadisht-43 (4.42 mg 100 g$^{-1}$) Sedona (3.8 mg 100g$^{-1}$) and hybrid, Don shoed maximum acidity (0.64%) as compared to other hybrids. High TSS (3.93 $^\circ$Brix AND 3.71 $^\circ$Brix) was recorded for Secona and Kareena, respectively.

The hybrids Multi Star, Silyon and Indam-Swadisht-43 were affected with less number of aphids per vine. The PDI of downy mildew disease was at low ebb in the hybrids, Don and Indam-Swadisht-43 (18.30 and 18.33, respectively). The cost economics revealed that Multi-Star and Silyon gave more net returns (Rs.49,10,125 and Rs.38,16,345) and high B:C ration (6.42 and 5.03), respectively when grown under 50% shade net. The outcome of the present investigation clearly indicates that the cucumber hybrids viz., Multi-Star and Silyon were best performers in terms of yield and net returnsz under 50% shade net environment.

221) “Survey and characterization of jackfruit (Artocarpus heterophyllus Lam.) germplasm available in andhra pradesh to identify elite trees”- V. Chandra Sekhar.

ABSTRACT

Jackfruit (Artocarpus heterophyllus Lam.) is one of the most important and unusual fruit of the Moraceae family which includes fig and mulberry. However, systematic work regarding characterization of jackfruit germplasm and study of genetic diversity is limited in India. Hence the present investigation was conducted at Horticultural Research Station, Venkataramannagudem, during the year 2011-2012 on 33 genotypes of jackfruit.

Major objectives of the study were to explore the variability in morphological characters of leaf and fruit and biochemical characters of fruit through a comprehensive survey in three districts of Andhra Pradesh.

A wide variation was noticed among the genotypes in all the three districts with respect to leaf characters like petiole length, leaf length, leaf width, leaf apex shape and leaf base shape except leaf margin.

Genotypes were surveyed in E.G, W.G, and Visakhapatnam districts and data were recorded from flowering to fruit maturity and based on season of fruit availability the genotypes were grouped into three namely i) early bearers (January - February), mid bearers...
(April - May) and late bearers (June - July). Most of the genotypes studied had their bearing on trunk and primary branches followed by bearing on trunk, primary, secondary branches.

Variation was noticed with respect to fruit shape, rind colour of jackfruit and flake colour at maturity. Wide variation was noticed in terms of biometric characters of fruit like stalk length of the fruits (2.57 cm to 7.35 cm), stalk diameter (1.60 cm to 3.05 cm), fruit length (23.50 cm to 56.75 cm), fruit diameter (15.50 cm to 31.00 cm), fruit weight (2.89 kg to 27.12 kg), fruit rind weight (1.07 kg to 7.40 kg), fruit rind thickness (0.66 cm to 2.24 cm), number of flakes per fruit (27 to 512), weight of flakes per fruit (0.84 kg to 14.45 kg), weight of fresh flake with seed (9.76 g to 39 g), weight of flake without seed (6.23 g to 32 g), flake: fruit ratio (10.45 % to 43.95 %), flake length (3.72 cm to 10.08 cm), flake width (2.29 cm to 5.27 cm), flake thickness (0.18 cm to 0.6 cm), and number of fruits per tree 18.5 to 217.5.

Significant variation was noticed with respect to biochemical characters of fruit like total soluble solids (19.7 °brix to 31.55 °brix); reducing sugars (6.05 % to 13.36 %); non-reducing sugars (8.34 % to 16 %); total sugars (18.65 % to 24.10 %) and β-carotene content (0.440 mg/100 g to 0.507 mg/100 g).

Genetic studies indicated high variability, heritability and genetic advance for the characters like number of flakes per fruit, number of fruits per tree, weight of flakes per fruit, fruit weight, weight of fresh flake with seed, weight of the fresh flake without seed and 100-seed weight indicating the effectiveness of direct phenotypic selection for improvement of these traits in jackfruit.

Significant correlation was noticed between the biometric characters of fruit like number of fruits per tree, fruit length and diameter, fruit weight, number of flakes per fruit, weight of flakes per fruit, rind weight, flake length, flake width, flake thickness, rachis length, rachis diameter, seed length, seed width, 100-seed weight suggesting good scope for improvement of yield.


ABSTRACT

The present investigation entitled “Studies on Bunch Management Practices in Tissue Culture Banana (Musa spp.) cv. Grand Naine” was carried out at Horticultural College and Research Institute, Anantharajupet during 2013-14. The experiment was laid out in a randomized block design replicated thrice with fourteen treatments. The treatment comprised of spraying the whole plant just after bunch emergence with different chemical combination and by adopting bunch feeding technique using cowdung in combination with different chemicals. The bunch yield attributes and quality parameters were studied.

With respect to yield parameters, less number of days for fruit maturity (86.90 days), the highest finger length (21.90 cm), finger girth (13.81 cm), finger weight at harvest (153.55 g), bunch weight (22.84 kg), hand weight (3.08 kg) and pulp weight (100.46 g) were observed with spraying of 0.25% potassium dihydrogen phosphate + 0.5% urea. Whereas, the highest finger weight after ripening (129.77 g) was recorded in treatment with spraying of 0.5% potassium sulphate + 0.5% urea.

The highest peel weight (44.04 g) was noticed in the treatment of bunch feeding with cowdung slurry containing 0.5% potassium nitrate + 0.5% potassium dihydrogen phosphate. Maximum thicknesses of peel (3.35 mm) was observed in control (without any spray and bunch feeding). The highest pulp to peel ratio was recorded in spraying of 0.25% potassium nitrate + 0.25% potassium dihydrogen phosphate (2.76).
With regard to fruit quality parameters, less acidity (0.141%), the highest total soluble solids (23.30°Brix), total sugars (18.75%), reducing sugars (7.66%) and non-reducing sugars (11.09%) were observed in the treatment with spraying of 0.25% potassium dihydrogen phosphate + 0.5% urea.

In respect of physiological characters, bunch feeding with cowdung slurry containing 0.5% potassium nitrate + 0.5% potassium dihydrogen phosphate (13.34%) had attained least physiological loss in weight. The treatment, spraying of 0.5% potassium dihydrogen phosphate recorded the highest shelf life of 11.63 days. Spraying of 0.25% potassium dihydrogen phosphate + 0.5% urea was superior in terms of maximum gross returns (319000.00), net returns (209590.37) and benefit-cost ratio (1.91).

223) “Heat accumulation studies in different varieties of grape (Vitis sps.)” – Y.Vijayanthi Kalyan.

ABSTRACT

The present investigation entitled “HEAT ACCUMULATION STUDIES IN DIFFERENT VARIETIES OF GRAPE (Vitis sps.)” was carried out during October 2013–April 2014 at Grape Research Station of Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad. The experiment was aimed to find out the heat unit requirements of the sixteen varieties evaluated. Another objective of this experiment was to find out the effect of accumulated heat units on growth, yield and overall quality in the sixteen varieties.

Among the sixteen varieties tested for growth parameters, the maximum pruning weight (3.35 kg/vine) was found in Shiraz, the maximum shoot length (204.5 cm) and number of leaves on shoot (68), number of nodes per shoot (17), cane diameter (15mm) was found in Bangalore Blue.

Regarding yield characters, the highest yield per vine (15.5 kg) was seen in Bangalore Blue, the highest number of bunches (178) was seen in Shiraz, the maximum bunch weight (364.9g) was seen in Rizamat.

In case of quality parameters, the highest TSS (21.65°Brix) and juice percentage (76%) was seen in Pusa Navrang, least titrable acidity (0.10%) seen in Rubi Red, maximum brix-acid ratio (18.95) in Madhu Angur and the maximum hundred berry weight (369g) was seen in Italia.

It was found in the experiment that there was wide variation in the requirement of heat units from variety to variety and stage to stage. However, the varieties Anab-e-Shahi (1864.3 GDD), Italia (1714.3 GDD), Bangalore Blue (1634.4 GDD) and Concord (1634.4 GDD) were found to require the maximum number of heat units from pruning to maturity, while the varieties Pusa Navrang (815.7 GDD) and Shiraz (836.6 GDD) were found to require the minimum number of heat units from pruning to maturity. The requirement of heat units also differed significantly with different phenological stages. On an average, the requirement of heat units was maximum for fruitset to maturity stage (676.4 GDD) followed by anthesis to fruitset stage (312 GDD). The panicle emergence to anthesis stage had the minimum requirement of heat units (88.2 GDD) followed by pruning to budbreak stage (140.3 GDD).
Regarding growth parameters, the last of the varieties to show budbreak viz., Anab-e-Shahi, Madhu Angur, Bangalore Blue, Concord were also the varieties showing maximum pruning weight, shoot length, leaf area indicating that growth relates proportionally to the accumulated heat units. However, such a pattern was not observed in case of yield parameters. In case of quality parameters, sugars increased and acids decreased with increase in accumulated heat units in individual varieties as expected because of ripening.

Correlation studies were also carried out among the different parameters and heat units accumulated in the sixteen varieties. Regarding growth and yield parameters, certain patterns of correlation were observed. A few of the parameters (number of leaves on shoot, leaf area, cane diameter, berry diameter and sunscald) correlated positively with the accumulated heat units while some parameters (juice percentage, number of bunches per vine and bunch length) correlated as significantly negative.

This experiment emphasized the importance of Heat Units as a non-destructive index of maturity compared to other methods such as DFFB (Days From Full Bloom), colour charts, etc. It is a more accurate measure of growth as temperature is also taken into account along with time. This method helps to analyse climate changes and its impact on plant growth and production over a period of time. It also allows to compare performance of plants of same or different varieties grown in different regions and seasons.

224) “Studies on the effect of phenotypes and different levels of nitrogen on growth and yield of kakrol (Momordica dioica Roxb.)” – Ch. Bindhu.

Abstract
The present investigation entitled “Studies on the effect of phenotypes and different levels of nitrogen on growth and yield of kakrol (Momordica dioica Roxb.)” was carried out during the kharif season of 2013-2014 at Horticultural College and Research Institute, Venkataramanagudem, West Godavari District of Andhra Pradesh. The study was carried out with 9 different treatments involving different combinations of different phenotypes and levels of nitrogen. The experiment was laid out in a randomized block design (RBD) with factorial concept replicated thrice and data on the effect of different phenotypes and nitrogen treatments on growth, yield and economics were recorded and statistically analyzed.

The influence of different phenotypes on plant growth parameters like number of primary branches, number of nodes per plant were significant and showed highest values in vines with single lobed leaves. On the other hand the lowest values were recorded on parameters viz., number of days taken to appearance of first female flower and node at which first female flower appear was lowest in vines with single lobed leaves. The yield contributing parameters like fruit length, number of fruits per plant, mean fruit weight, net plot yield, estimated fruit yield, fresh seed weight and nitrogen uptake were recorded highest in vines with single lobed leaves.

Among the nitrogen levels, the higher values for plant growth parameters with respect to length of main shoot at last harvest, number of branches at last harvest, internodal length, number of days taken for appearance of first female flower, number of nodes per plant at harvest and days to last harvest were recorded with the application of 375 kg N ha\(^{-1}\). The yield contributing parameters like number of fruits per plant, mean fruit weight, net plot yield, estimated fruit yield and fresh seed weight, nitrogen uptake were also recorded higher with the nitrogen application of 375 kg N ha\(^{-1}\).

Among the different interaction effects between phenotypes and nitrogen levels showed significant influence in most of the growth and yield characters viz., number of primary
branches at last harvest, number of fruits per plant, maximum net plot yield, estimated fruit yield. However, fruit length, fruit diameter, mean fruit weight, number of seeds per fruit, seed weight per fruit and quality parameter i.e., ascorbic acid did not differ significantly. The gross returns and net returns recorded maximum vines with single lobed leaves with application of 375 kg N ha\(^{-1}\) resulting in a maximum benefit-cost ratio of 2.18.

Among the different treatment combinations, it was found that the treatment combination vines with single lobed leaves with application of 375 kg N ha\(^{-1}\) proved to be the best and economical for cultivation of kakrol under light soils of coastal Andhra Pradesh.


**ABSTRACT**

A set of three experiments, on the effects of antioxidants (benzyl adenine 50, 100 ppm, methyl jasmonate 0.1,1µM or thiabendazole 500,750 ppm and oxalic acid 4, 6 mmol) modified atmosphere packaging (fruits packed in polypropylene bags with 2 pores, 4 pores, 6 pores, 8 pores and 10 pores) and combination of antioxidants (four best of antioxidants) and MAP (first two best of MAP) on chilling injury and storage life of guava cv. Allahabad safeda stored at 6 ± 1º C was conducted at Fruit Research Station, Sangareddy, Medak District, Telangana. In all the experiments, the design followed is completely randomized design with factorial concept with three replications per treatment. Various physical parameters like PLW (%), fruit firmness (kg.cm\(^{-2}\)), chilling injury (rotting, skin scald), shelf life (in days), ripening (in days), organoleptic evaluation and biochemical parameters like TSS (°Brix), titratable acidity (%), ascorbic acid (mg/100g), brix-acid ratio and electrolyte leakage (%) were estimated at an interval of 5 days during storage in all the experiments.

Guava fruits cv. Allahabad safeda were dipped in different concentrations of antioxidants and stored at 6 ± 1º C. Fruits treated with benzyl adenine 50 ppm recorded significantly lowest PLW, ripening and highest fruit firmness, organoleptic evaluation. Significantly lowest chilling injury was recorded in the fruits treated either with benzyl adenine 50 ppm or methyl jasmonate 0.1µM with corresponding increase in the shelf life of up to 26.63, 25.42 days respectively. The fruits kept under control recorded the shelf life of up to 20.05 days only. BA 50 ppm and methyl jasmonate 0.1µM have significantly reduced the chilling injury and corresponding electrolyte leakage. Biochemical parameters like titratable acidity and electrolyte leakage were significantly lowest in the fruits treated with benzyl adenine 50 ppm. Significantly highest TSS and brix-acid ratio were recorded in fruits treated with benzyl adenine 50 ppm. Significantly highest ascorbic acid was recorded with either benzyl adenine 50 ppm or methyl jasmonate0.1 µM.

Guava fruits cv. Allahabad safeda were packed in polypropylene bags with different ventilation (2, 4, 6, 8 and 10 pores) and stored at 6 ± 1º C. Fruits packed in polypropylene bags with 4 pores significantly recorded lowest PLW. Significantly highest fruit firmness and organoleptic evaluation were recorded in fruits packed in polypropylene bags with 4 pores. Significantly lowest chilling injury and electrolyte leakage was recorded in fruits packed in polypropylene bags with 4 pores and corresponding increase the shelf life of upto 25.63 days. The fruits kept under control recorded a shelf life of 20.05 days only. Titratable acidity was significantly lowest in fruits packed in polypropylene bags with 4 pores. Fruits packed in polypropylene bags with 4 pores recorded significantly highest TSS, brix-acid ratio and
Guava fruits cv. Allahabad safeda were treated with four best antioxidants (benzyl adenine 50 ppm or methyl jasmonate 0.1µM or thiabendazole 500 ppm and oxalic acid 6 mmol) and then packed in two best treatments of MAP (fruits packed in polypropylene bags with 2 pores or 4 pores) and stored at 6 ± 1°C. The combination treatments of fruits packed in polypropylene bags with 4 pores + benzyl adenine 50 ppm recorded significantly lowest chilling injury and corresponding electrolyte leakage followed by 4 pores + methyl jasmonate 0.1µM or 4 pores + thiabendazole 500 ppm or 4 pores + oxalic acid 6 mmol recorded significantly lowest chilling injury correspondingly increased the shelf life upto 29.45, 28.40, 28.38 and 28.35 days respectively. The combination treatments of fruits packed in polypropylene bags with 4 pores + benzyl adenine 50 ppm recorded significantly lowest ripening, PLW, highest fruit firmness and highest organoleptic evaluation. Biochemical parameters like highest TSS, highest ascorbic acid and lowest electrolyte leakage were recorded with the fruits packed in polypropylene bags with 4 pores + benzyl adenine 50 ppm. Significantly lowest titratable acidity was recorded with the fruits packed in polypropylene bags with 4 pores + benzyl adenine 50 ppm. Significantly highest brix-acid ratio was recorded with the fruits packed in polypropylene bags with 4 pores + benzyl adenine 50 ppm. The combination of antioxidants and MAP enhanced the shelf life of 4.46 and 4.17 days over the MAP or antioxidants used alone, respectively.


**ABSTRACT**

Okra (Abelmoschus esculentus (L.) Moench) is a traditional pod vegetable crop of high nutritional, medicinal, industrial and economic values in India. The productivity potential and economic viability of okra in tribal, rural and peri-urban vegetable farming systems is low owing to the low yielding potential, susceptibility to yellow vein mosaic virus (YVMV) and sub-optimal pod quality. The productivity potential and economic viability of okra systems can be enhanced by the development of advanced varieties having high yield potential coupled with YVMV resistance and superior pod quality attributes. A set of 25 inbred lines (RNOYR-30 to RNOYR-54) along with one YVMV resistant check (RNOYR-16), one YVMV susceptible check (RNOYR-19) and two commercial checks (Arka Anamika and Pusa Sawani) were characterized for 18 qualitative traits and evaluated for 18 quantitative traits in a randomized block design with 3 replications at Vegetable Research Station, Dr. Y. S. R. Horticultural University, Rajendranagar, Telangana, India during summer, 2014 to identify the horticulturally superior inbred lines on the basis of their production potential, YVMV resistance and superior pod quality attributes, to identify the diverse inbred lines, to determine the yield components and suitable selection methods. The analysis of variance of RBD revealed highly significant differences for all agro-economic traits indicating presence of great amount of variability in the material under study. On the basis of production potential for various agro-economic traits including marketable pod yield per plant, resistance to YVMV and acceptable pod quality attributes, the inbred lines RNOYR-54 (399.93 g of marketable pod yield per plant and zero percent YVMV incidence), RNOYR-51 (383.67 g of marketable pod yield per plant and zero percent YVMV incidence) and RNOYR-37 (320.58 g of marketable pod yield per plant and zero percent YVMV incidence) were found to be horticulturally superior, which can be either exploited for commercial cultivation after multi-environment
testing or utilized in the future breeding programmes for the development of advanced open pollinated varieties or F1 hybrids in okra.

Genetic divergence analysis following Mahalanobis D2 statistics and Tocher’s method revealed distinct clustering pattern with 5 clusters and considerable genetic diversity in the material under study. The characters YVMV infestation, fruit length and days to 50% flowering with high per cent of contribution to total divergence (55.17%, 14.29% and 8.62%, respectively) were the potent variables in differentiating the breeding material under study. The use of diverse inbred lines from the divergent clusters with high intercluster distance (cluster III and IV, I and III and clusters II and III) in hybridization is expected to result in high heterosis and throw desirable transgressive segregants. Genetic variability analysis revealed high magnitude of genetic variability and high degree of transmission of majority of the growth, earliness and yield associated traits under study. High magnitude of genotypic coefficient of variation (>20%) for number of marketable fruits per plant, marketable yield per plant and yellow vein mosaic virus infestation indicated high degree of genetic variability offering great scope for selection of these characters. High heritability (>60%) coupled with high expected genetic advance (>20%) for number of marketable fruits per plant, marketable yield per plant and yellow vein mosaic virus infestation indicated the involvement of additive gene action and more chances of fixing by selection to improve such traits. Phenotypic and genotypic correlation coefficient analysis revealed positively significant association of number of branches per plant, days to last fruit harvest, fruiting period and number of marketable fruits per plant and total yield per plant and negatively significant association of yellow vein mosaic virus infestation with marketable yield per plant. Genotypic path coefficient analysis revealed that number of branches per plant, days to 50% flowering, days to first fruit harvest, fruiting period, fruit length, total number of fruits per plant, number of marketable fruits per plant, pod borer infestation and yellow vein mosaic virus infestation are the key agro-economic traits having high to very high genotypic direct effect on marketable yield per plant and are thus identified as yield components in okra. From the correlation and path coefficient analysis, it is evident that direct selection for number of branches per plant and number of marketable fruits per plant, indirect selection for fruiting period and restricted simultaneous selection for yellow vein mosaic virus infestation are effective in okra.


**ABSTRACT**

An experiment was conducted to standardize the optimum age of root stock seedling for micro-budding under open and shade net conditions and also to study the extent of bud wood transmissible diseases (HLB & CYMV) in microbudded plants through molecular indexing during the period from November 2013-August, 2014 at Citrus Research Station, Tirupati, Dr. Y.S.R. Horticultural University, Chittoor district of Andhra Pradesh.

A comprehensive study of results revealed that budlings prepared on six month old Rangpur lime root stock seedlings were found to take minimum time for sprouting and recorded maximum success percentage of budded plants, highest bud wood size, maximum number of sprouts, number of nodes and leaves, maximum leaf length and width and also in respect of sprout growth, scion stem diameter closely followed by the budlings prepared on five month old Rangpur lime root stock seedlings. However, as compared to the budlings prepared in both open and shadenet condition height of plant and length of the initial sprout per budling were found to have moderate values with respect to scion stem diameter.

Among different growing conditions the highest bud survival was recorded in open condition which supported greater vigour of scion sprouts as evident from the data obtained on
number of growth flushes and number of nodes. On the other hand shadenet was found to produce earliest sprouts but ranked after open condition in yielding successful budlings which were stouter.

Among the interactions, budlings prepared in the six month old root stock seedlings under open conditions were found to record the highest survival percentage followed by those under shade net house. The next superior values were found to be recorded by the budlings prepared in the five month old root stock seedlings under open conditions followed by the budlings prepared in the four month old root stock seedlings under shade conditions.

In the budlings the extent of disease transmission among the different age groups microbudded, HLB was observed with 451 bp amplicon in 6th month age of the root stock under open field condition while Citrus Yellow Mosaic virus was amplified with 726 bp in the same age of root stock under shade net condition through Molecular screening by Duplex PCR. Amplification of no pathogens were observed in early age group root stocks.

It can be concluded by the present study that the warm conditions and raising temperatures in the open found to favour higher success of microbudding in sweet orange cv. Sathgudi and early age i.e., four and five months old root stock propagation by microbudding reduce or nullify the incidence of budwood transmissible diseases both under open and shadenet. The duplex-PCR method developed in the present investigation proved to be highly sensitive, economic and reliable method for detection of bud wood transmissible diseases in citrus budwood certification programme to obtain disease-free planting material.

228) “Effect of different sources of fertilizers with stage wise rates of application on growth, yield and quality of tomato (Solanum lycopersicum var. Arka Vikas)” – Vasa Anil Kumar.

ABSTRACT

The present investigation was undertaken to study the effect of different sources of fertilizers with stage wise rates of application on growth, yield and quality of tomato (Solanum lycopersicum var. Arka Vikas) during Rabi, 2013-14 at Vegetable Research Station, Rajendranagar, Hyderabad. The experiment was laid out in Randomized block design comprising of seven treatments with three replications.

The treatments consist of two sources viz., water soluble fertilizers (Ammoium Sulphate and Soluble fertilizer [13-0-45 NPK]) and straight fertilizers (Urea and Murate of Potash). Each treatment was divided into three splits and given as stage wise from 0-45 days, 46-90 days and 91-135 days of crop duration where phosphorus applied as basal dose in the form of SSP in all the treatments, and the fertigation was given at five days interval. Conventional application of urea, single super phosphate and murate of potash following drip irrigation were taken as control.

From the study, the results enunciated that the growth parameters were influenced by different sources of fertilizers in split doses applied at stage wise significantly. Highest leaf area (913.73 cm²) at 90 days after transplanting (DAT), dry matter production per plant at 45 DAT (69.37g), 90 DAT (75.90g) and 135 DAT(77.43g) respectively, days to first fruit set (43.0) and days to first fruit harvest (62.7) were recorded with fertigation of straight fertilizers at the rate of 33 per cent each at 45,90 and 135 DAT and found to be on par with water soluble fertilizers fertigated at the rate of 33 per cent each at 0-45, 46-90 and 91-135 days stages while, plant height and number of primary branches were found to be non-significant.
Data on yield and yield contributing characters differed significantly among the different treatments. Number of fruits per plant (39.86), average fruit weight of tomato (51.80g), fruit yield per plant (2005 g) and fruit yield per hectare (668.63q) and crop duration (144.0 days) were registered significantly higher with application of 100 per cent recommended dose of straight fertilizers at the rate of 33 percent, each upto 0-45,46-90 and 91-135 days stages of the crop and were on par with fertigation of water soluble fertilizers at the rate of 33 percent each 0-45,46-90 and 91-135 days stages.

With regard to the quality parameters there was no significant different among the treatments except for lycopene and ascorbic acid content of the fruit. However higher values for lycopene (7.45mg/100g) and ascorbic acid (3.27mg/100g) were recorded with application of 100 percent recommended dose of straight fertilizers at the rate of 33 percent each given at 0-45, 46-90 and 91-135 days stages and were on par with water soluble fertilizers at the rate of 33 percent each at 0-45, 46-90 and 91-135 days stages.

The highest cost: benefit ratio (1:3.32) was obtained with the fertigation of straight fertilizers at the rate of 33 percent of recommended dose each at 0-45, 46-90 and 91-135 days stages. The lowest cost: benefit ration (1:1/18) was recorded in control.

229) “Studies on the value addition of karonda (carissa carandas L.) juice by blending with guava, papaya and pineapple juices for RTS beverage”- Shaik Shaheel.

ABSTRACT

The present investigation entitled “Studies on the value addition of karonda (Carissa carandas L.) juice by blending with guava, papaya and pineapple juices for RTS beverage” was carried out during the year 2014-15 at Department of Post Harvest Technology, Horticultural College and Research Institute, Dr. Y. S. R Horticultural University, Venkataramannagudem, West Godavari district of Andhra Pradesh.

The focus of the present study is utilization of karonda for preparation of karonda RTS by using guava, papaya and pineapple blended juices. The experiment was conducted in completely randomized design and statistically analyzed for the parameters of density (kg/m³), pH, total soluble solids (°Brix), titrable acidity (%), TSS/Acid ratio, total sugars (%), reducing sugars (%), non-reducing sugars (%), ascorbic acid (mg/100 g), organoleptic evaluation during storage and cost benefit were studied in the preparation of karonda RTS.

Among the different treatments, RTS prepared from 25% karonda juice + 75% pineapple juice blend (T₉) was found best with density of 1.05 kg/m³, pH of 3.32, total soluble solids of 14.78°Brix, titrable acidity of 0.27%, TSS/Acid ratio of 56.84, total sugars of 13.53%, reducing sugars of 6.92%, non-reducing sugars of 6.61% and ascorbic acid of 4.04 mg/100 g during different interval of storage, followed by RTS prepared with 50% karonda juice + 50% guava juice blend (T₂) with density of 1.02 kg/m³, pH of 3.02, total soluble solids of 13.11°Brix, titrable acidity of 0.29%, TSS/Acid ratio of 46.48, total sugars of 12.97%, reducing sugars of 6.94%, non-reducing sugars of 6.03% and ascorbic acid of 8.56 mg/100 g during storage.

The organoleptic score for acceptability of RTS prepared from pineapple with karonda juice blend of 25% karonda juice + 75% pineapple juice blend (T₉) followed by 50% karonda juice + 50% pineapple juice blend (T₈) and RTS prepared from 50% karonda juice + 50% guava juice blend (T₂) and 25% karonda juice + 75% guava juice blend (T₃) were found best their quality parameter upto 60 days of storage and they are economical for utilization of karonda juice with different blends of pineapple and guava for their RTS preparation.
RTS prepared from pineapple costs ₹70 per litre, guava RTS costs of ₹58 per litre, papaya RTS costs of ₹58 per litre over the karonda RTS of ₹40 per litre as per the prevailing price of local market were taken into consideration for calculation of cost benefit ratio for the RTS prepared from karonda blended juices. The highest cost benefit ratio of 1:2.68 was found in 25% karonda juice + 75% pineapple juice (T9) followed by 1:2.59 in 25% karonda juice + 75% guava juice (T3), 1:2.56 in 25% karonda juice + 75% papaya juice (T6) and the lowest cost benefit ratio 1:1.77 was found in 100% karonda juice (T10) of their economic feasibility.

230)“Strategies for extending the shelf life of chrysanthemum (Dendranthema grandiflora L.) loose flowers under ambient and cold storage conditions” – K. Latha.

ABSTRACT

The present experiment entitled “Strategies for extending the shelf life of Chrysanthemum (Dendranthema grandiflora L.) Loose Flowers under Ambient and Cold storage conditions” was carried out at College of Horticulture, Rajendranagar, Hyderabad during 2012-2013. The main objective of the experiment was to study the effect of different post harvest chemicals, packaging and storage temperatures on shelf life of chrysanthemum loose flowers. Freshly harvested chrysanthemum flowers of var Raichur local were dipped in Sucrose @ 16%, Aluminium sulphate @ 600 ppm, Boric acid @50 ppm and Citric acid @ 300 ppm with a control (without chemical dipping) and packed in polypropylene packaging of 60 microns with 0% ventilation and stored under ambient (temperature 26 ± 3°C and RH 60-80% (February 2013) and in cold storage at 4 °C temperatures. Observations were recorded on qualitative, physiological and biochemical changes that occurred during storage of chrysanthemum loose flowers. The study was done in two experiments in completely randomized design with three replications.

The first experiment was conducted to evaluate the effect of post harvest chemicals along with polypropylene packaging (60 microns with 0% ventilation) on the shelf life of chrysanthemum loose flowers under ambient conditions. Among the different chemical treatments the post harvest chemical dipping in sucrose @16% resulted in the maximum shelf life of 7 days while the control flowers recorded minimum storage life of 3.17 days at ambient conditions in poly propylene packing. Flower freshness was determined by quantifying it in terms of reflected radiation by using quantum sensor and observations recorded were in positive correlation with color retention. Qualitative parameters like flower diameter and flower freshness were also significantly high(48.84mm & 2.23 µmol s-1 m-2 respectively) in sucrose@16% treatment than in control (27.28mm and 0.73 µmol s-1 m-2 respectively). Physiological parameters such as colour retention (Hue and brightness) were more in sucrose@16% treatment and recorded an increase of 511.97% and 106.68% respectively over control. Similarly sucrose@16% treatment also recorded more of Relative water content (RWC) and Membrane stability index (MSI) (25.72 & 156.13% respectively) over the control. However, there was significant gradual decline in all these parameters during storage of flowers. Among all the treatments the lowest values in efflux of K+ ions (35.93ppm) and lipid peroxidase activity (1.49 mmol of MDA) were recorded in sucrose@16% treatment when compared with control (198.70ppm & 3.86 mmol of MDA respectively). The protein content (16.68g/100g) in the petals was the highest and increased during flower storage in sucrose@16% treatment, while lowest values were observed in control (11.86g/100g), which was 40.6% more against control.

In the second experiment, the effect of different postharvest chemicals along
The shelf life of chrysanthemum loose flowers treated with 16% sucrose along with polypropylene packaging was the highest i.e. 23.67 days as against 8.33 days in control. Qualitative parameters like flower diameter and flower freshness on 9th day of storage were more by 92.55% and 143.65% over control respectively and progressively increased during storage of flowers up to 21st day in 16% sucrose treatment. Physiological and bio-chemical parameters such as colour retention was more in respect of lightness (114.25%), hue (177.63%), brightness (126%), RWC (59.03%), MSI (205.40%) over control on 9th day of storage in 16% sucrose flowers and declined during storage. Efflux of K+ ion and Lipid peroxidase activity was low by 56.30%, 50.24% respectively in 16% sucrose treatment over control on 9th day and further gradually increased during storage. The protein content in the petals increased significantly up to 21st day and on 9th day protein content was 131.55% more over control in 16% sucrose treated chrysanthemum flowers.

The present study has established that delay in flower senescence in chrysanthemum loose flowers and extension of shelf life is possible by dipping flowers in 16% sucrose solution along with packing in polypropylene (60 microns) with 0% ventilation by 7 days under ambient conditions and up to 23.67 days under cold storage condition (4°C). Further, a positive correlation existed between membrane stability, protein levels and shelf life extension in chrysanthemum loose flowers along with related qualitative parameters such as flower diameter and flower freshness. While a negative correlation existed between efflux of K+ ion, lipid peroxidation and shelf life of chrysanthemum loose flowers.

231) “Performance of vegetable French bean (Phaseolus vulgaris L.) as influenced by varieties and sowing dates under southern zone of Andhra Pradesh” – B. Venkata Subbaiah Yadav.

ABSTRACT

The present investigation entitled “Performance of vegetable French bean (Phaseolus vulgaris L.) as influenced by varieties and sowing dates under southern zone of Andhra Pradesh” was carried out during rabi season of 2013-14 at Horticultural College and Research Institute, Dr. Y.S.R. Horticultural University, Anantharajupet, Y.S.R. District of Andhra Pradesh.

The experiment was laid out in randomized block design with factorial concept with four varieties of French bean viz., Aparna, Arka Anoop, Arka Sharath and Arka Suvidha and four sowing dates such as second fortnight of October, first fortnight of November, second fortnight of November and first fortnight of December. There were sixteen treatment combinations replicated thrice. Observations were recorded on growth and reproductive parameters, yield and yield attributes and quality parameters. The data recorded on plant growth parameters revealed that the maximum plant height (30.42 cm at 30 DAS and 43.69 cm at harvest) and number of primary branches plant-1 (3.32 at 30 DAS and 6.32 at harvest) were observed in the variety, Arka Sharath. Among four varieties of French bean evaluated, Arka Suvidha was identified early with respect to number of days to first flowering, 50 per cent flowering and first pod picking (33.08, 35.90 and 46.23, respectively). With regard to yield and yield attributes, maximum number of pod bearing clusters plant-1 (4.23), single pods plant-1 (15.55), cluster pods plant-1 (8.54) and total number of pods plant-1 (24.09) were recorded with Arka Sharath whereas, the highest number of pods cluster-1 was recorded in Arka Anoop (2.07). Arka Sharath recorded maximum pod length (15.33 cm) while, Arka Anoop recorded
maximum pod width and ten pod weight (1.01 cm and 66.46 g, respectively). The higher green pod yield (156.27 g plant-1, 4.37 kg plot-1 and 87.37 q ha-1) was obtained with Arka Sharath. In respect of quality traits, the variety Arka Sharath recorded maximum crude protein content (3.09 mg 100 g-1) and minimum fibre content (1.72%) in green pods. Sowing during first fortnight of November recorded higher plant height (31.10 cm at 30 DAS and 44.48 cm at harvest) and maximum number of primary branches plant-1 (3.40 at 30 DAS and 6.37 at harvest). Among different sowing dates of French bean, first fortnight of December sown crop recorded minimum number of days to first flowering (32.37), 50 per cent flowering (35.10) and first pod picking (44.82). Maximum number of pod bearing clusters plant-1 (4.38), number of pods cluster-1 (2.06), number of single pods plant-1 (17.30), number of cluster pods plant-1 (9.02) and total number of pods plant-1 (26.32) were recorded with second fortnight of October sowing which was superior to all other dates of sowing. The highest pod length and pod width (15.14 cm and 0.92 cm, respectively) and ten pod weight (66.01 g) were recorded in first fortnight of November sown crop. The green pod yield was significantly higher (167.51 g plant-1, 4.73 kg plot-1 and 94.68 q ha-1, respectively) when the crop was sown during second fortnight of October. Significantly maximum crude protein content (3.02 mg 100 g-1) and minimum crude fibre content (1.75%) in green pods were recorded with second fortnight of October sown crop. The interaction effect between varieties of French bean and sowing dates was significant with regard to total number of pods plant-1 and green pod yield. Maximum number of pods plant-1 was obtained with Arka Anoop (28.40) sown during second fortnight of October. Arka Sharath recorded maximum green pod yield plant-1 (196.53 g) with first fortnight of November sowing. Arka Anoop recorded maximum green pod yield plot-1 and green pod yield ha-1 (5.50 kg and 109.9 q, respectively). The highest gross returns (Rs. 219808 ha-1), net returns (Rs. 164077 ha-1) and benefit cost ratio (2.94) were obtained with the variety, Arka Anoop sown during second fortnight of October. Based on the results of the study, it was concluded that the French bean varieties, Arka Anoop and Arka Sharath were best suited for growing in southern zone of Andhra Pradesh and the ideal time for sowing of these varieties was during second fortnight of October and first fortnight of November, respectively.


ABSTRACT

An experiment entitled Effect of chemicals, organic and inorganic mulches on weed control in tuberose (Polianthes tuberosa L.), cv. Hyderabad Single was conducted during 2014-2015 in Kharif season at All India Coordinated Research Project on Floriculture, Floriculture Research Station, Agricultural Research Institute, Rajendranagar, Hyderabad. There were 10 treatments, each replicated thrice in RBD.

The treatments consists of oxyfluorfen (pre-emergent) @ 0.15 kg a.i. ha-1 followed by quizalofop ethyl as post emergence @50 g a.i. ha-1 30 DAP (T1), atrazine (pre-emergent) @ 1.0 kg a.i. ha-1 followed by quizalofop ethyl as post emergence @ 50 g a.i. ha-1 30 DAP (T2), oxyfluorfen (pre-emergent) @ 0.15 kg a.i. ha-1 followed by hand weeding at 30 DAP (T3), atrazine (pre-emergent) @ 1.0 kg a.i. ha-1 followed by hand weeding at 30 DAP (T4), pendimethalin as pre emergent @ 0.75 kg a.i. ha-1 followed by quizalofop ethyl as post emergence @ 50 g a.i. ha-1 (T5), pendimethalin as pre emergent @ 0.75 kg a.i. ha-1 followed by one hand weeding at 30 DAT (T6), Black polyethylene sheet mulch (T7) Paddy straw mulch (T8), Hand weeding @ 20,40 & 60 DAP (T9) and Unweeded control (T10).
Mulching with black polythene sheet recorded significantly higher vegetative parameters like average plant height and number of leaves per plant at 30, 60, 90 and at 120 days after planting. Floral parameters viz., days to spike emergence and full bloom, more no. of flowers per plant and were recorded maximum in treatments pendimethalin followed by hand weeding. Floret length, spike length and days to flower withering were recorded maximum in black polythene sheet mulch.

The weed control treatments also showed significant difference in duration of flowering. Among the treatments hand weeding showed extended period of flowering. Black polythene sheet mulch was recorded significantly superior flower yield per plant and per hectare. At all the crop growth stages, black polythene sheet mulch followed by hand weeding recorded lowest weed density and dry weight of weeds. The highest weed control efficiency and least weed index was noticed in black polythene sheet mulch followed by pendimethalin as pre-emergent + hand weeding.

However unweeded control recorded highest weed density, dry weight, weed index and lower weed control efficiency. With respect to flower quality, yield and to maintain the field weed free for a longer period of time, black polythene sheet mulch can be recommended. The highest net returns and B:C ratio was obtained in treatment pendimethalin as pre-emergent + hand weeding followed by hand weeding. From the results it can be summarized that among the weed control treatments pendimethalin as pre-emergent + hand weeding may be recommended for reducing weed population, better growth and for higher yields in areas having labour problem.

233) “Dehydration studies in carnation flowers” – S. Sindhuja.

ABSTRACT

The present investigation entitled “Dehydration studies in carnation flowers” was carried out in the department of Floriculture and Landscape Architecture, College of Horticulture, Rajendranagar, Hyderabad during the year 2014.

A total set of four experiments were conducted to study the performance of various desiccants (Experiment-I), drying methods (Experiment-II) and predrying treatments (Experiments-III & IV) on the production of quality dry flowers in carnation. The experiments I & II were investigated with the carnation cultivars Harvey and Gaudina in Factorial Completely Randomized Design. Based on the results of experiment I & II the best carnation cultivar (Harvey), embedding medium (Borax+Silica gel) and drying method (Hot air oven drying at 55 ±1 oC) were chosen to determine the effect of pre drying treatments on the quality of carnation flowers in Completely Randomized Design.

In the studies on the effect of different embedding media on production of quality dry flowers in carnation, cv. Gaudina recorded maximum flower dry weight (1.55 g) and dry flower diameter (3.86 cm). Cv. Harvey registered significantly maximum percent moisture loss (79.39%), minimum time for drying (7.55 days) and maximum score for color (1.80), shape (2.26), texture (2.57), brittleness (2.22) and overall acceptability (2.13). Among the embedding media, sand recorded maximum dry flower weight (1.95 g), dry flower diameter (4.15 cm) and textural score (3.61). Control without embedding medium recorded maximum percent moisture loss (83.51). Silica gel embedded flowers took minimum time (3.06 days) for drying. Maximum score for color (2.11), shape (3.73), brittleness (3.13) and overall acceptability (2.58) was recorded with the flowers embedded in borax + silica gel (1:1,v/v) mixture.
With respect to the studies on the influence of different methods of drying on dry flower quality of carnation, it was found that among the cultivars, maximum flower dry weight (1.51 g) and dry flower diameter (3.47 cm) was recorded with cv. Gaudina. Maximum per cent moisture loss (76.70), minimum time for drying (60.29 h) and maximum score for color (1.85), shape (2.71), texture (2.06) and overall acceptability (2.26) was recorded with cv. Harvey.

Maximum dry weight (2.19 g) and dry flower diameter (4.07 cm) was recorded with hot air oven drying at 40 ± 1 °C. Maximum score for color (2.20), texture (2.65), brittleness (3.40) and overall acceptability (2.11) was recorded when the flowers of carnation were dried in hot air oven at 55 ± 1 °C. Maximum percent moisture loss (83.50) was observed with air drying under shade and microwave oven drying took minimum time for drying (0.03 h). Maximum score for shape was recorded with hot air oven 40 ± 1 °C.

The study on the effect of pre drying treatments (steam blanching and organic acids) on dry flower quality in carnation cv. Harvey revealed non significant differences with respect to dry flower weight, dry flower diameter, percent moisture loss and time taken to dry. Pre drying treatment of carnation flowers with citric acid (0.5%) for 15 minutes recorded maximum score for color (2.97), shape (2.92), texture (3.40), brittleness (3.32), overall acceptability (3.65) and total carotenoid content (66.30 µg/g).

The experiment on effect of pre drying treatments (chemicals) on dry flower quality of carnation showed non significant differences in carnation dry flower weight, dry flower diameter, percent moisture loss and time taken to dry. Maximum score for colour (3.17) shape (2.67), texture (3.25), brittleness (3.42), overall acceptability (3.70) and total carotenoid content (80.72 µg/g) in cv. Harvey was recorded with the pre drying treatment of magnesium chloride (10%) for 5 h.

The findings from the study showed that drying of pre treated flowers (citric acid 0.5% for 15 min or MgCl2 10% for 5 h) of carnation cv. Harvey in hot air oven at 55 ± 1 °C with borax + silica gel (1:1, v/v) mixture as the embedding media could result in better quality dehydrated flowers.

234) “Studies on quality and shelf life of jamun juice alone and blended with guava and pomegranate juice” – D.Sridhar.

**ABSTRACT**

A set of three experiments were conducted on “Studies on quality and shelf life of jamun juice alone and blended with guava and pomegranate juice” at College of Horticulture, Mojerla, Mahabubnagar District. All the experiments were carried out in CRD with factorial concept. Five treatments were replicated four times in the first experiment and six treatments replicated four times in second and third experiments. Various Physico-chemical parameters like TSS(ºB), pH, Ascorbic acid (mg/100g), Total sugars (%), Titrable acidity (%), Anthocyanins (mg/100g), Phenols (mg/100ml), Microbial count (cfu/ml) were analysed and organoleptic evaluation was carried out for three months with 15 days interval at ambient condition during storage period of 90 days.

The first experiment was carried out with jamun juice alone with different preservation methods in five treatments viz., sodium benzoate at 350 and 500 ppm, pasteurization at 80 ± 5°C for 10 minutes, combination of sodium benzoate and pasteurization at both conditions and stored at ambient condition for three months. Highest TSS (ºB), pH, ascorbic acid (mg/100 ml), total sugars (%), anthocyanins (mg/100 ml), phenols (mg/100 ml) were recorded in pasteurization of jamun juice (at a temperature of 80°C ± 5°C) 10 minutes + 500 ppm sodium
benzoate and the lowest was registered in the treatment, Pasteurization of jamun juice (at a temperature of 80°C ± 5°C) 10 minutes. The overall acceptability of the juice with good appearance, aroma and flavour, taste and minimum microbial count was recorded in treatment pasteurization of jamun juice (at a temperature of 80°C ± 5°C) 10 minutes + 500 ppm sodium benzoate.

The second experiment was carried out with jamun juice blended with guava juice pasteurized and treated with 500ppm sodium benzoate in six treatments like 100 % Jamun juice, 90 % Jamun juice + 10 % Guava juice, 80 % Jamun juice + 20 % Guava juice, 70 % Jamun juice + 30 % Guava juice, 60 % Jamun juice + 40 % Guava juice, 50 % Jamun juice + 50 % Guava juice and stored at ambient condition for three months. The highest TSS (°B), ascorbic acid (mg/100 ml), total sugars (%) phenols (mg/100 ml) were recorded in treatment, 80 % Jamun juice + 20 % Guava juice + 500 ppm Sodium benzoate. The treatment, 50 % Jamun juice + 50 % Guava juice + 500 ppm Sodium benzoate has recorded highest pH, lowest titrable acidity, phenols and anthocyanins. 100 % Jamun juice + 500 ppm Sodium benzoate was recorded highest anthocyanins and acidity. The overall acceptability of the blended juice with good appearance, aroma and flavour, taste and minimum microbial count was recorded in treatment, 80 % Jamun juice + 20 % Guava juice + 500 ppm Sodium benzoate.

The third experiment was carried out with jamun and pomegranate juice blends pasteurized and treated with 500ppm sodium benzoate in six treatments like 100 % Jamun juice, 90 % Jamun juice + 10 % Pomegranate juice, 80 % Jamun juice + 20 % Pomegranate juice, 70 % Jamun juice + 30 % Pomegranate juice, 60 % Jamun juice + 40 % Pomegranate juice, 50 % Jamun juice + 50 % Pomegranate juice and stored at ambient condition for three months. The highest total sugars and anthocyanins were recorded in treatment, 100 % Jamun juice + 500 ppm Sodium benzoate. The treatment, 90 % Jamun juice + 10 % Pomegranate juice + 500 ppm Sodium benzoate has recorded highest TSS (°Brix), pH, ascorbic acid (mg/100 ml) and phenols (mg/100 ml). The overall acceptability of the blended juice with good appearance, aroma and flavour, taste and minimum microbial count was recorded in treatment, 90 % Jamun juice + 10 % Pomegranate juice + 500 ppm Sodium benzoate.

In the first experiment, Pasteurization of jamun juice (at a temperature of 80°C ± 5°C) + 500 ppm sodium benzoate, in the second experiment 80 % Jamun juice + 20 % Guava juice + 500 ppm Sodium benzoate and in the third experiment, 90 % Jamun juice + 10 % Pomegranate juice + 500 ppm Sodium benzoate were recorded as the best beverages.

235) “Effect of nitrogen levels and planting geometry on growth and yield of golden rod (Solidago canadensis L.).”-Anushri Agrawal.

ABSTRACT

A study was conducted on the effect of nitrogen levels and planting geometry on growth and yield of golden rod at Horticultural College and Research Institute, Venkataramannagudem during the year 2014-15. The objective of the study was to analyse the effect of nitrogen levels, planting geometry and their interaction on growth, yield and quality of golden rods under local agro-climatic conditions. The experiment consisted of two factors one on nitrogen levels (0, 100, 200 and 300 kg ha⁻¹) and the other on planting geometry levels (45 cm x 30 cm, 30 cm x 30 cm, 45 cm x 15 cm and 30 cm x 15 cm). These two factors were imposed at four levels each making sixteen treatment combinations in 4² factorial design. The observations were recorded at 30, 60 and 90 DAP on vegetative, reproductive and flower quality and yield parameters. Most of the vegetative parameters like plant height, number of leaves, leaf area were maximum.
at 90 DAP with the application of nitrogen at 300 kg ha\(^{-1}\) and it was on par with 200 kg ha\(^{-1}\) Among the planting geometry levels these characters at 90 DAP were highest with 45 cm x 30 cm on par with 30 cm x 30 cm spacing. As regards to interaction maximum values of these parameters were recorded at 300 kg ha\(^{-1}\) in combination with 45 cm x 30 cm but it was on par with 200 kg ha\(^{-1}\) plus 45 cm x 30 cm spacing and 300 kg ha\(^{-1}\) plus 30 cm x 30 cm spacing. The results on number of suckers and plant spread also showed that the application of nitrogen at 300 kg ha\(^{-1}\) and 45 cm x 30 cm was the best. By virtue of fresh weight and dry weight of whole plant and its components, it is inferred that maximum with a dose of nitrogen at 300 kg ha\(^{-1}\) plus 45 cm x 30 cm spacing but was at par with 200 kg ha\(^{-1}\) plus 45 cm x 30 cm. The earliest flowering in terms of first panicle initiation, 50% flowering and complete flowering was noticed with lower dose of nitrogen plus closer spacing (30 cm x 15 cm). The number of days taken for first harvest and initiation of second panicles after first harvest was significantly highest with a dose of nitrogen at 300 kg ha\(^{-1}\) plus 45 cm x 30 cm spacing on par with nitrogen at 200 kg ha\(^{-1}\) with 45 cm x 30 cm and nitrogen at 300 kg ha\(^{-1}\) with 30 cm x 30 cm spacing. The qualitative characters like length and breadth of inflorescence, number of primary branches, vase life and longevity of panicle was maximum with higher dose of nitrogen i.e. 300 kg ha\(^{-1}\) and wider spacing of 45 cm x 30 cm. Similarly, the time taken for first floret opening, completion of all florets opening and withering of apical florets was earlier with lower dose of nitrogen (0 kg ha\(^{-1}\)) and 30 cm x 15 cm spacing. Maximum delay was observed with the highest dose of nitrogen in combination with widest spacing.

The highest number of panicles per plot (71.88) was registered by the highest dose of nitrogen (300 kg ha\(^{-1}\)) but was on par with 200 kg ha\(^{-1}\) of nitrogen (69.94) whereas, among planting geometry levels, 30 cm x 15 cm registered the highest value (109.32) followed by 45 cm x 15 cm (74.56). The interaction of nitrogen at 300 kg ha\(^{-1}\) + 30 cm x 15 cm spacing recorded maximum value (111.08) and was on par with nitrogen at 200 kg ha\(^{-1}\) + 30 cm x 15 cm (109.23). On the contrary, the number of marketable panicles was significantly higher with the application of nitrogen at 200 and 300 kg ha\(^{-1}\) and planting geometry levels of 30 cm x 30 cm and 45 cm x 30 cm which were at par with each other. The combinations of these levels also were found to excel significantly the other treatment combinations but were on par among them. Therefore, the application of nitrogen at 200 kg ha\(^{-1}\) in combination with 30 cm x 30 cm geometry of planting would be giving higher number of marketable golden rods without significant reduction in the quality and quantity as compared to the highest nitrogen dose i.e. 300 kg ha\(^{-1}\) and the widest spacing i.e. 45 cm x 30 cm.


ABSTRACT

Field and lab experiments were conducted during kharif 2014 to study the “Validation of different IPM Modules and Pesticide Residue Pattern in Okra [Abelmoschus esculentus(L.) Moench.]” at College Farm, College of Horticulture, Rajendranagar, Hyderabad and All India Network Project on Pesticide Residues, Rajendranagar, Hyderabad, Telangana. The field experiment was laid out in a Randomized Block Design with eight IPM modules which were replicated thrice.

During the entire crop growth, the minimum mean larval population of Earias vitella (0.16 larvae per plant) was observed in Insecticide Module (M\(_7\)) which was on par with Dr.YSRHU recommended Module (M\(_4\)), NCIPM recommended Module (M\(_5\)) and Bio intensive Module + Insecticide Module (M\(_6\)). The maximum mean population of E. vitella was
(2.86 larvae per plant) observed in untreated check (M₈). The data recorded on percent shoot damage during crop overall period revealed that Bio intensive Module + Insecticide Module (M₆) was best in which least percent shoot damage was observed. The maximum mean percent shoot damage 14.83 was recorded in control (M₈).

The percent fruit damage by *E. vitella* during crop period revealed that Insecticide Module (M₇) module was found best which was on par with Bio intensive module + Insecticide Module (M₆).

In the entire okra crop period the mean population of leaf hoppers was significantly minimum (1.99/leaf) in Insecticide Module (M₇) which was on par with NCIPM recommended Module (M₅) and Bio intensive Module + Insecticide Module (M₆). The maximum mean population of leaf hoppers was (6.69) observed in control Module (M₈). The overall mean population of whiteflies (0.45 per leaf) during entire crop period was observed minimum in Insecticide Module (M₇) which was on par with NCIPM recommended Module (M₅), Bio intensive Module + Insecticide Module (M₆).

The thrips population (0.95 per leaf) was found significantly minimum in Bio intensive Module + Insecticide Module (M₆) which was on par with Insecticide Module (M₇). The maximum mean population of thrips was (3.74/leaf) observed in control (M₈). Regarding mites significantly minimum population (0.14 mites per leaf) was observed in Insecticide Module (M₇) which was on par with NCIPM recommended Module (M₅), Bio intensive Module + Insecticide Module (M₆) while the maximum mean population of mites was (4 mites/leaf) observed in control (M₈).

The mean population of coccinellids was significantly maximum (2.05/leaf) in control (M₈) which was on par with NCIPM recommended module (M₅). The maximum net returns (Rs. 2,07,100ha⁻¹) were recorded in NCIPM recommended module (M₅) followed by Dr.YSRHU recommended module (M₄), Bio intensive module + Insecticide Module (M₆) Bio intensive module (M₂) and Bio intensive module + Insecticide Module (M₆). The benefit cost ratio 3.91 was highest in NCIPM recommended module (M₅) followed by Bio intensive module (M₂), Insecticide Module (M₇) and Bio intensive module + Insecticide Module (M₆).

In residue analysis the okra samples collected from non IPM farmer’s fields had pesticide residues of quinalphos (0.003ppm), ethion (0.35ppm), bifenthrin (0.02ppm), triazophos (2.01ppm), chloropyrifos (0.05ppm) and (0.08ppm). However the okra samples collected from IPM fields did not have any pesticide residues.

Among the weather parameters in the present study, sunshine hours showed significantly positive correlation (r = 0.408) while minimum temperature, morning Relative humidity, evening Relative humidity, rainfall and rainy days were shown significantly negative correlation on *Earias vitella*. A significant positive correlation was found between maximum temperature(r = 0.581), sunshine hours (r = 0.561) and percent shoot damage whereas rainfall, rain days, evening R. H and minimum temperature were shown significantly negative correlation. For percent fruit damage, sunshine hours and maximum temperature had significant positive correlation while rainfall, rainy days, minimum temperature and morning relative humidity were shown significant negative correlation.

The sunshine hours and maximum temperature were found significant positive correlation whereas rainfall, rainy days, minimum temperature and morning Relative humidity were shown negatively significant correlation on percent fruit damage. The morning Relative
humidity and sunshine hours were positively correlated with leafhoppers population while rainfall and rainy days were shown significant negative correlation.

The results of simple correlation between whiteflies and weather parameters indicated that a significant positive correlation \((r = 0.361)\) was observed at maximum temperature and sunshine hours. Minimum temperature evening Relative humidity, rainfall and rainy days were negatively associated with whiteflies population. Maximum temperature \((r = 0.371)\) and sunshine hours \((r = 0.500)\) found to exert a significant positive correlation with thrips population while minimum temperature \((r = -0.420)\), rainfall \((r = -0.585)\) and rainy days \((r = -0.770)\) were found to exert negative significant action on thrips population.

Regarding mite population the maximum temperature \((r = 0.581)\) and sunshine hours \((r = 0.551)\) found to be exert a significant positive correlation while minimum temperature \((r = -0.754)\), rainfall \((r = -0.423)\) and rainy days \((r = -0.807)\) had negative significant action. A significant positive correlation \((r = 0.571)\) was found between morning Relative humidity and coccinellids population whereas Evening relative humidity \((r = -0.351)\), rainfall \((r = -0.557)\) and rainy days \((r = -0.633)\) were found to exert negative significant action on coccinellids population.

During the total crop period the population of \(E.\) vitella was negatively regressed with maximum temperature, minimum temperature, evening relative humidity and rainfall but positively regressed with morning relative humidity, sunshine and rainy days. The population of leafhoppers was positively regressed with minimum temperature, relative humidity, rainfall, sunshine and rainy days. The population of whiteflies was positively regressed with maximum temperature minimum temperature, relative humidity and rainfall. It was negatively regressed with sunshine and rainy days. During the total crop period, the population of mites was negatively regressed with maximum temperature and evening relative humidity but it was positively regressed with minimum temperature morning relative humidity, sunshine, rainfall and rainy days.

The population of coccinellids was positively regressed with maximum temperature, morning relative humidity and evening relative humidity but it was negatively regressed with minimum temperature, sunshine, rainfall and rainy days. In overall, the weather parameters jointly had non significant impact on population build up of mites and coccinellids.

237) “Studies on influence of different sources and levels of potassium on vegetative growth, flower yield and carotenoids content of african marigold (tagetes erecta linn.) cv. maxima yellow”– Mokana Sanghamitra.

**ABSTRACT**

The present investigation entitled ‘Studies on influence of different sources and levels of potassium on vegetative growth, flower yield and carotenoids content of African marigold \((Tagetes erecta\) Linn.) cv. ‘Maxima Yellow’’ was carried out at Horticultural College and Research Institute, Venkataramannagudem, West Godavari District of Andhra Pradesh during kharif, 2014-2015. The experiment was laid out in a randomized block design with 13 treatments and each treatment replicated thrice. The data recorded on various parameters \(viz.,\) vegetative growth, reproductive growth, physiological growth rates, flower yield, carotenoids content, nutrient status of soil and plant and nutrient uptake of plant after harvest were statistically analyzed.
Significant differences were observed among different levels of potassium applied on various vegetative growth parameters in African marigold cv. ‘Maxima Yellow’. Among all the treatments, potassium applied at the rate of 240 kg/ha showed significantly the best results with many of the vegetative growth parameters viz., plant height (47.86 cm), number of primary branches (11.73), number of secondary branches (30.86), plant spread (49.50 cm) and leaf area per plant and it was at par with the application of potassium at the rate of 200 kg/ha. Further, there were no significant differences between the sources of potassium applied at same level on vegetative growth parameters.

Significant differences were observed among different levels of potassium applied on various reproductive growth and yield parameters in African marigold cv. ‘Maxima Yellow’. Among all the treatments, potassium applied at the rate of 240 kg/ha showed significantly the best results with respect to reproductive growth and yield parameters and it was at par with the application of potassium at the rate of 200 kg/ha. However, a few reproductive growth parameters viz., flower diameter and number of flowers per plant have recorded significantly the best results with the application of potassium at the rate of 240 kg/ha followed by application of potassium at the rate of 200 kg/ha without any significant differences between the sources of potassium applied. The yield parameters viz., yield per plot (14.03 kg) and yield per hectare (223.66 q) recorded significantly the highest values with the application of potassium at the rate of 240 kg/ha in the form of sulphate of potash followed by muriate of potash at the same level. Significant differences were observed between the sources of potassium applied on yield per plot and yield per plant.

Significant differences were observed among different levels of potassium applied on various physiological growth parameters in African marigold cv. ‘Maxima Yellow’. Among all the treatments, potassium applied at the rate of 240 kg/ha showed significantly the best results with respect to physiological growth parameters and many a times were at par with the application of potassium at the rate of 200 kg/ha. Further, there were no significant differences between the sources of potassium applied on many physiological growth parameters.

Based on nutrient uptake studies it may be concluded that the available potassium content in the soil, plant and potassium uptake by the plant were found non-significant between the applications of potassium at the rate of 240 kg/ha and 200 kg/ha irrespective of the sources of potassium applied.

Significant differences were observed between the sources and levels of potassium applied on carotenoids content of African marigold cv. ‘Maxima Yellow’ flower petals at all the stages of harvesting of the flowers. Among all the treatments, potassium applied at the rate of 240 kg/ha in the form of sulphate of potash showed significantly the highest carotenoids content in flower petals which was at par with the application of potassium at the rate of 200 kg/ha in the form of sulphate of potash. Further, it was noticed that sulphate of potash recorded significantly the highest carotenoids content in the flower petals when compared with muriate of potash at the same level of potassium application.

Among all the treatments, potassium applied at the rate of 240 kg/ha showed significantly the highest vase life which was at par with the application of potassium at the rate of 200 kg/ha without any significant differences between the sources of potassium application at the same level.

Based on the results obtained it may be concluded that application of potassium at the rate of 200 kg/ha in the form of muriate of potash can be recommended if the crop is grown exclusively for flower yield. If the crop is grown for pigment (carotenoids) extraction then it is recommended to apply potassium at the rate of 200 kg/ha in the form of sulphate of potash to avoid the chloride accumulation with the use of muriate of potash.

ABSTRACT

The present investigation was undertaken to study the effect of foliar application of nutrients on yield, quality and shelf life of custard apple (*Annona squamosa* L.) cv. Balanagar during year 2014-15 at Horticulture Research Station, Konda mallepally, Nalgonda. The experiment was laid out in Randomized block design comprising of ten treatments replicated thrice.

The treatments consist of urea, KNO$_3$ and ZnSO$_4$ with each of three different concentrations. The treatments were viz., foliar application of urea @ 0.5 % (T$_1$), urea @ 1 % (T$_2$), KNO$_3$ @ 0.5 % (T$_3$), KNO$_3$ @ 1 % (T$_4$), KNO$_3$ @ 1.5 % (T$_5$), ZnSO$_4$ @ 0.2 % (T$_6$), ZnSO$_4$ @ 0.4 % (T$_7$), ZnSO$_4$ @ 0.6 % (T$_8$) and control treatment with only water spray (T$_{10}$). The treatments were imposed two times during the crop period viz., 1 month before flowering and at the time of fruit set.

From the study the results enunciated that the yield contributing and yield characters were significantly influenced by foliar application of different concentrations of nutrients. Number of fruits per plant (29.83), fruit length (10.45 cm), fruit breadth (12.35 cm), average fruit weight (264.72 g), fruit yield per plant (7.9 kg) and pulp per cent per fruit (40.1%) were reported highest with the foliar application of KNO$_3$ @ 1.5 %. This treatment was also results in better values for rind per cent per fruit (52.67%), seed per cent per fruit (5.47%) and seed number per fruit (15). Stone fruits per tree were found to be non- significant.

Data on quality of fruit among the treatments differed significantly. TSS (21.09°Brix), brix-acid ratio (108.44), total sugars (15.59%), reducing sugars (13.39%), non reducing sugars (2.2%) and ascorbic acid content (45.38 mg/ 100g) of fruits were registered significantly higher with the foliar application of KNO$_3$ @ 1.5 % while, titrable acidity (0.16%)was found to be significantly higher with the foliar application of urea @ 1.5%.

With regard to the storage studies there was no significant difference among the treatments except for TSS content in fruits. However higher value for TSS content (23.09°Brix) was recorded with application of KNO$_3$ @ 1.5%. Among the storage studies, physiological loss in weight (PLW), spoilage percentage and shelf life of fruits were found to be non significant with foliar application of different concentrations of nutrients.


ABSTRACT

A set of three experiments consisting of different types of antioxidant solutions (200 ppm of chlorinated water, 5000 ppm of ascorbic acid and 5000 ppm of citric acid), packaging material (80, 150 guage of Polypropylene bags and 100, 150 guage of Low Density Polyethylene bags) and combination of antioxidant solutions (first two best of antioxidant) and packaging material (first two best of packaging) on the quality of minimally processed pomegranate aril cv. Bhagwa was evaluated during storage temperatures (5°C, 15°C and ambient temperature) for 6, 9, 12 and 14.39 days, at Post Harvest Technology Research Station, Rajendranagar, Dr. YSRHU. In all experiments the design adopted is Factorial Completely Randomized Design. Various physical parameters like PLW (%), Hunter color Lab values ($L^*$, $a^*$ & $b^*$), spoilage (%), shelf life (days) and organoleptic evaluation and quality parameters like TSS (°Brix), Acidity (%), Brix-acid ratio, sugars (%), Ascorbic acid (mg 100 g$^{-}$)}
Minimally processed pomegranate arils cv. Bhagwa, washing the arils with chlorinated water 200 ppm followed by ascorbic acid 5000 ppm and citric acid 5000 ppm were selected, and packed with or without wrapping plastic cups and then stored at 5°C led to the best quality preservation. Among them, arils washed with chlorinated water 200 ppm plus ascorbic acid 5000 ppm recorded significantly lowest PLW, highest Hunter color Lab values (L*, a* & b*), lowest spoilage percentage and increased shelf life of 9 days (with wrapping) and 6 days (without wrapping) whereas non-washed arils recorded a shelf life of 4.33 days only. Quality parameters like TSS, brix-acid ratio, sugars (reducing, total and non-reducing sugars), Ascorbic acid were also recorded significantly highest in arils washed with chlorinated water 200 ppm plus ascorbic acid 5000 ppm in cups without and with wrapping. Arils treated with chlorinated water 200 ppm plus ascorbic acid 5000 ppm was superior for organoleptic attributes.

Minimally processed pomegranate arils cv. Bhagwa were packed in 80, 150 guage of Polypropylene bags and 100, 150 guage of Low Density Polyethylene bags stored at 5°C. Arils packed with Low Density Polyethylene bags with 150 guage recorded significantly lower PLW than unpacked arils. Significantly the highest Hunter color Lab values (L*, a* & b*) were recorded in arils packed in 80 guage of Polypropylene bags. Arils packed in 80 guage of Polypropylene bags significantly recorded lower spoilage and correspondingly increased the shelf life up to 12 days and superior for appearance and overall acceptability in both with or without wrapping. Quality parameters like TSS, Acidity, brix-acid ratio, sugars (reducing, total and non-reducing sugars), ascorbic acid were significantly highest in arils packed with Polypropylene bags with 80 guage. Arils packed in 80 guage of Polypropylene bags were superior for organoleptic attributes.

Minimally processed pomegranate arils cv. Bhagwa were treated with first best of two antioxidants (chlorinated water plus ascorbic acid and chlorinated water plus citric acid) and then packed in second best of two packaging material (80, 150 guage of Polypropylene bags) and stored at 5°C, 15°C and ambient temperature. Arils treated with chlorinated water 200 ppm plus ascorbic acid 5000 ppm and then packing in Polypropylene bags with 100 guage recorded significantly lower PLW than unpacked arils. Significantly the highest Hunter color Lab values (L*, a* & b*), lowest spoilage and correspondingly increased the shelf life up to 14.39 days at 5°C, 4.54 days at 15°C and 1.55 days at ambient temperature were recorded in arils treated with chlorinated water plus ascorbic acid and then packing in Polypropylene bags with 80 guage. Unpacked arils recorded a shelf life of 4.58 days stored at 5°C, 3.99 days stored at 15°C and 1.45 days only stored at ambient temperature. Quality parameters like TSS, Acidity, brix-acid ratio, sugars (reducing, total and non-reducing sugars), ascorbic acid was recorded to be significantly highest in arils treated with chlorinated water plus ascorbic acid and then packing in Polypropylene bags with 80 guage. Arils treated with chlorinated water 200 ppm plus ascorbic acid 5000 ppm then packed in Polypropylene bags with 80 guage were superior for organoleptic attributes.


ABSTRACT

The present investigation entitled “Evaluation of gladiolus (Gladiolus hybrida L.) hybrids under coastal Andhra Pradesh conditions” was conducted during the period from October, 2014 to February, 2015 at Horticulture College and Research Institute, Dr. Y.S.R Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh. The major objectives were to find out the most suitable hybrid of gladiolus under local agro-
climatic conditions and to analyze variability, correlation and path coefficients for various quantitative traits.

The experiment was laid out in RBD with three replications and nine treatments namely American Beauty, Arun, Darshan, Green Star, Limoncello, Pink Lady, Meridiana, White Prosperity and Dhiraj (Check). The observations were recorded on various growth, floral, floral quality, spike yield, corm and corm yield parameters. Growth parameters like plant height, number of leaves per plant and leaf area per plant was recorded at 30 DAP, 60 DAP and at maturity. Spike and corm yield per plant, per plot and per ha was maximum in the hybrid Darshan. Early sprouting of corms was recorded in Meridiana and other growth parameters like maximum plant height at maturity was obtained by White Prosperity and minimum was recorded in American Beauty. Green Star recorded more number of leaves per plant at maturity whereas, White Prosperity was found to have maximum leaf area per plant at maturity. Among the different hybrids Limoncello exhibited earliness in terms of spike initiation, full spike emergence, showing colour by basal floret and opening of basal floret whereas Meridiana recorded maximum. The hybrid White Prosperity recorded the highest spike length, rachis length, number of florets per spike, floret length, floret diameter and vase life. Minimum spike length was recorded in Dhiraj, rachis length in Limoncello, number of florets per spike in Green Star, floret length and floret diameter in Darshan.

The highest number of spikes yield per plant, per plot and per ha was recorded by Darshan (2.26, 63.46 and 377.76 respectively) followed by White Prosperity (1.86, 52.26 and 311.09 respectively). Other hybrids viz., American Beauty (1.40), Arun (1.40)andPink Lady (1.33) were found to be on par with check variety Dhiraj (1.53) with respect to number of spikes per plant.

However, with respect quality of spikes, the maximum floret length, floret diameter and vase life (10.78 cm, 10.06 cm and 10.96 days) was recorded by the hybrid White Prosperity. Limoncello followed it in terms of floret length and floret diameter. However, the hybrids Meridiana, Pink Lady, Arun and American Beauty were at par with White Prosperity in terms of floret diameter indicating that these hybrids produced spikes with bold sized florets. In terms of vase life, only Pink Lady could follow White Prosperity. The check variety Dhiraj recorded these qualities at minimum level.

With respect to corm and corm yield parameters White Prosperity recorded maximum number of cormels per plant, corm diameter, corm weight per plant and weight of corm and cormels per plant. Minimum corm diameter was recorded in Darshan. Darshan recorded maximum number of corms per plant, per plot and per ha, and minimum was obtained by Limoncello and Meridiana.

Variability studies revealed that the highest range in terms of both PCV and GCV were recorded by character the traits number of cormels per plant, number of corms per plant, days taken for sprouting of corm, number of spikes per plant, weight of corm and cormels per plant, corm weight, leaf area per plant at maturity, spike length, plant height at maturity, number of florets per spike, corm diameter and spike length recorded values in high range whereas, the traitsfloret length, floret diameter and number of leaves per plant at maturity recorded at low range.

High heritability coupled with high genetic advance as per cent over mean was noticed for the traits viz., number of cormels per plant, number of corm per plant, days taken for sprouting of corm, weight of corm and cormels per plantand number of spikes per plant.

Correlation analysis revealed that at both genotypic and phenotypic level, the number of spikes per plant was found to be significantly and positively associated with number of corms per plant, vase life, number of florets per spike, number of days taken for sprouting of corm, weight of corm and cormels per plant and corm weight per plant.
Path coefficient analysis was performed by taking number of spikes per plant as dependent variable and it has explained 79% variation in it, since the residual effect was 0.21. The highest value of positive direct effect on number of spikes per plant was registered by days taken for full spike emergence (2.34) and weight of corm and cormel per plant followed by number of corms per plant.

The characters exhibited negative direct effects on number of spikes per plant among them the highest negative effect was recorded by number of days taken for spike initiation followed by number of days taken for sprouting of corms and spike length.


ABSTRACT

A set of two experiments on the effect of different bioregulators, zinc sulphate (ZnSO₄) @ 0.1%, potassium nitrate (KNO₃) @ 1%, phosphoric acid (H₃PO₄) @ 0.5%, potassium di hydrogen ortho phosphoric acid (K₂H₂PO₄) @ 1%, (paclobutrazol (PBZ) @ 3ml.m⁻¹ canopy diameter, napthalene acetic acid (NAA) @ 80 ppm, giberillic acid (GA₃) @ 20 ppm, 1-2-chloro-4pyridl-3-phenyl urea (CPPU) @ 10ppm, potassium sulphate (K₂SO₄) @ 1%, their combinations utilizing BBCH scale of mango on flowering, fruit set and yield of mango cv. Banganpalli, was conducted at Fruit Research Station, Sangareddy, Dr. YSRHU, A.P. In two experiments the design adopted was Randomized Block Design with three replications per treatment. Various vegetative parameters like number of new flushes, internodal length (cm), flowering parameters like days taken for panicle initiation, days taken for 50 per cent flowering and full flower opening, per cent of flowering, panicle length and panicle breadth (cm), and yield parameters like number of days taken for fruit set from panicle initiation, number of fruits panicle⁻¹, number of fruits tree⁻¹, fruit weight (g) and yield (kg tree⁻¹) were recorded.

In the first experiment, mango cv. Banganpalli trees were sprayed with flower bud break enhancing bioregulators and vegetative growth enhancing bioregulators and their combinations. Phosphoric acid (H₃PO₄) treatment has significantly retarded vegetative growth in terms of decrease in number of new flushes and reduced internodal length when compared to control and other treatments. The combination spray of zinc sulphate + potassium nitrate + potassium di hydrogen ortho phosphoric acid has significantly increased the yield by 19.9% to 38.79 kg.tree⁻¹ over control of 32.3 kg.tree⁻¹. The increase in yield by zinc sulphate + potassium nitrate + potassium di hydrogen ortho phosphoric acid treatment is due to significant increase in fruit set and fruit weight.

In the second experiment, mango cv. Banganpalli trees were sprayed with bio regulators, growth regulators and their combinations. Trees applied with paclobutrazol alone significantly reduced the vegetative growth in terms of minimum number of new flushes and internodal length compared to control trees and other treatments. Paclobutrazol alone and in combinations with other bio regulators significantly minimized the number of days taken for panicle initiation and increased the number of days taken for 50 percent and 100 percent flowering opening, duration of flowering along with increase in percentage of flowering, panicle length and breadth when compare to control trees. However, paclobutrazol and NAA alone are equally effective in significantly increasing the yield by 23.7% and 20.96% over control respectively. The increase in yield by paclobutrazol and NAA is attributed to increase in fruit set and subsequent number of fruits per tree over control.

ABSTRACT

The present investigation entitled “Evaluation of bitter gourd (Momordica charantia L.) varieties for growth, yield and quality in Coastal District of Andhra Pradesh” was conducted during kharif season 2014 at Horticulture College and Research Institute, Dr. Y.S.R Horticultural University, Venkataramanagudem, West Godavari district, Andhra Pradesh.

The experiment was laid out in RBD with three replications and twelve treatments namely (Meghana, Pusa Vishesh, Arka Harit, Pusa Aushadhi, CO-1, Green Long, Hirkani, Nobel Katahi, Karnataka Local, Solan Hara, Local Check, Pusa Do Mausami (Check)). Data was collected on vine length, number of primary branches per vine, number of nodes on main vine, days to first male and female flower anthesis, node at which first male and female flower appeared, number of male and female flowers per vine, sex ratio, fruit set percent, number of fruits per vine, fruit weight, fruit length, yield per vine, seeds per fruit, 100 seed weight, vitamin C content, protein content, crude fiber content. Data collected was subjected to analysis of variance to test significant difference among the varieties and to estimate correlation between yield and yield attributing characters.

Among the varieties evaluated, Pusa Aushadhi exhibited earliness in terms of days taken for anthesis of first male and female flower, node at which first male and female flower appeared and days to first harvest and had low sex ratio, whereas Green Long regarded late for the same traits with higher sex ratio. Variety Solan Hara showed maximum fruit set percentage followed by Hirkani, while Nobel Katahi recorded minimum fruit set percentage.

Variety Hirkani recorded more number of fruits per vine (39.23) and fruit diameter (7.01 cm), Pusa Vishesh recorded maximum fruit weight (133.23 g), and fruit length was high in Green Long (24.23). Whereas Local check found inferior for the characters like, number of fruits/vine, fruit weight, fruit length and fruit diameter. Yield per vine (3.38 kg), yield per plot (40.41 kg) and estimated yield (169.00 q/ha) were recorded highest in Hirkani, followed by Solan Hara and it was lowest in Local Check.

Seeds per fruit, 100 seed weight were high in CO-1 variety, while minimum was recorded in Local check. Arka Harit recorded maximum germination percentage coupled with high seed vigour, Local check found inferior for the same traits. With respect to quality parameters Meghana found superior over all the varieties with high vitamin C (114.33 mg/100g), proteins (0.043 g/100g) and lowest crude fiber content (1.17%) and ranked highly bitter in organoleptic studies, where the variety Pusa Aushadhi recorded lower values for quality traits and ranked low for bitterness.

Correlation analysis revealed that at both genotypic and phenotypic level, the yield per vine was found to be significantly and positively associated with vine length, number of primary branches, nodes on main, node at which first female flower appeared, number of female flowers per vine, fruit set percentage, number of fruits per vine, fruit weight, fruit
length, number of seeds per fruit and 100 seed weight. It exhibited significant negative association with sex ratio.


**ABSTRACT**

The present investigation entitled “Studies on osmotic dehydration of aonla (*Emblica officinalis* L.)” was carried out during the year 2014-15 at Post Harvest Technology laboratory, Horticultural College and Research Institute, Dr.Y.S.R.H.U, Venkataramannagudem, West Godavari district of Andhra Pradesh.

A set of two experiments were carried out to study the effect of sugar and salt as osmotic agents on osmotic dehydration of aonla in Completely Randomized Block Design with factorial concept and the treatments were replicated thrice.

These studies were aimed to know the effect of syrup concentrations at 50°, 60° and 70° Brix with solution temperatures of 50° C, 60° C and 70° C maintained initially and later the segments were kept in the solutions for about 24 hours of osmosis in the first experiment and salt concentrations at 15 %, 20 % and 25 % with solution temperatures of 40° C, 50° C and 60° C maintained initially at the time of dipping and then left for 1 hour of osmosis in the second experiment.

After osmosis of the aonla segments in the sugar solutions these were laid on the tray drier for drying. After osmotic dehydration, the aonla segments were packed in low density polythene covers and stored at ambient temperature for a period of 120 days.

In the first experiment, the physico-chemical properties, microbial count and organoleptic quality of the products were evaluated during the storage period. The range of moisture loss (10.00 -23.77 %), weight loss (1.87-3.10 %), solid gain (7.17-21.89 %), dehydrated yield (28.67-40.67 %), moisture content (10.27-13.67 %), ascorbic acid (283.33-208.30 mg100 g⁻¹), titrable acidity (1.90-0.53 %), total soluble solids (36.40-56.13° Brix), total sugars (41.56 -65.04 %), reducing sugars (12.84 -27.66%)), non-reducing sugars (26.27-39.52 %), total phenols (1230.00 - 410.00mg 100g⁻¹) were recorded during storage period. Irrespective of the treatments, no microorganism was detected upto 120th day of storage period.

An increase in syrup concentrations from 50° to 70° Brix and solution temperatures from 50° C to 70° C for 24 hours of osmosis increased the weight loss, solid gain and dehydrated yield of aonla segments. However, steeping of segments in 70° Brix sugar syrup at 70° C for 24 hours (T₉) resulted in the highest sensory score (92.83), while the lowest (54.20) was recorded in steeping of segments in 50° Brix sugar syrup at 50° C for 24 hours (T₁).

In the second experiment, the effect of salt as an osmotic agent on osmotic dehydration of aonla was studied. The physico-chemical properties, microbial count and organoleptic quality were evaluated during the storage of the aonla segments. The range of moisture loss (9.20-16.40%), weight loss (2.50-4.50 %), solid gain (6.30-13.10 %), dehydrated yield (35.60-43.20 %), moisture content (10.73-13.67 %), ascorbic acid content (391.67-218.67 mg 100g⁻¹) titrable acidity (1.68 -0.79 %), total soluble solids (13.00 -5.17° Brix), total sugars (2.65-1.83 %), total phenols (1220.00-183.33 mg 100 g⁻¹) were recorded during the storage period. From initial day of storage to 120th day of storage there was no microorganism traceable. An increase in NaCl concentrations from 15 % to 25 % and solution temperatures from 40° C to 60° C for 1 hour increased weight loss, solid gain and dehydrated yield of the aonla segments. It was found that steeping of segments in 15 % NaCl at 40° C for1 hour resulted in the highest sensory score (69.36), while the lowest (61.70) was noticed in steeping of aonla segments in 15 % NaCl at 60° C for1 hour (T₉).
ABSTRACT

The present investigation entitled ‘Studies on evaluation of different turf grass species with different methods of establishment’ was carried out at Horticultural College and Research Institute, Venkataramannagudem, West Godavari District of Andhra Pradesh during 2014-2015. The objective of the present investigation was to evaluate the best turf grass species and method of establishment in terms of early and firm establishment under Godavari zone of Andhra Pradesh. The experiment was laid out with four different turf grass species and two different methods of establishment in factorial randomized block design (FRBD) and replicated thrice. The data recorded on various vegetative growth, physiological growth and soil parameters were analysed statistically and the results were summarised into an abstract.

The effect of different methods of establishment on vegetative and physiological growth parameters were found to be differed significantly and recorded the highest values with planting of turf grass species in dibbling method of establishment than in turf plastering method of establishment on all the dates of observations recorded. Further, it was observed that different methods of establishment showed no significant differences for soil nutrient status and all the soil physical properties except for soil EC.

Among the turf grass species evaluated, Bermuda grass recorded significantly the highest values for vegetative growth parameters with respect to less number of days taken for germination (4.20 days), germination percentage (80.17%) and ground cover percentage (96.03%), number of nodes per stolon (32.00), number of leaves per stolon (1089.50), number of roots per stolon (172.00) and root length and distribution (16.34 cm) at 120 days after planting. The physiological growth parameters like chlorophyll-a content (2.34 mg/g), chlorophyll-b content (1.00 mg/g), total chlorophyll content (3.24 mg/g), fresh and dry weight of root (9.74 and 4.32 g respectively), root length density (RLD) (11.94 cm/g/m$^3$) and root mass density (RMD) (6.12 g/g/m$^3$) were observed significantly the highest in Bermuda grass species. Non significant differences were observed among different turf grass species with regard to soil nutrient status (N, P and K) and all the soil physical properties except for soil EC.

The interaction effects between methods of establishment and turf grass species were found to be significant for most of the parameters. Bermuda grass planted with dibbling method of establishment showed significantly the highest values for most of the vegetative and physiological growth parameters on all the dates of observations recorded. However, non significant differences were found among the interaction effects for soil nutrient status (N, P and K) and all the soil physical properties except for soil EC.

Based on the individual and interaction effects between methods of establishment and turf grass species, it was observed that Bermuda grass planted with dibbling method of establishment recorded the best values with respect to less number of days taken for germination (3.30 days), germination percentage (84.67%) and ground cover percentage (99.33%) when compared with other combination of treatments. Hence, it could be concluded that the treatment combination of Bermuda grass planted in dibbling method of establishment proved to be the best grass and method of planting/establishment for an early and firm establishment of the lawn under the coastal tropical humid climatic conditions of Andhra Pradesh.

245) “Studies on genetic variability, heritability, correlation and path coefficient analysis in okra (Abelmoschus esculentus (L.) Monech) genotypes. – B. Chandra Mouli.”
ABSTRACT

An experiment was taken up to elicit the information on magnitude of genetic variability, heritability and to predict the gains realized through selection, character association, cause and effect relationships and divergence for the quantitative characters in okra (*Abelmoschus esculentus* (L.) Monech) genotypes. Twenty eight genotypes of okra along with two checks were evaluated in RBD with three replications during kharif season of 2014-15 at Horticultural College and Research Institute, Dr. Y. S. R. Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh.

The study revealed significant differences among the genotypes for different characters studied. Among the characters studied, high PCV and GCV were observed for fruit yield per plant (g), fruit yield per plot (kg) and YVMV infestation (%) indicating high variability available in the germplasm for these characters with scope for further improvement. Among all the genotypes studied, genotype IC 14909 recorded the highest fruit yield per plant and was found more suitable to the local agro-climatic conditions. The genotypes IC 18533 and IC 15537 were also found to be elite for different yield attributing characters.

High heritability coupled with high genetic advance as per cent of mean was observed for characters viz., number of primary branches per plant, number of nodes on main stem, intermodal length (cm), leaf area (cm$^2$), number of fruits per plant, fruit yield per plant (g), fruit yield per plot (kg) and YVMV infestation (%) signifying that these characters were least influenced by the environmental effect, since they were governed by additive genes and selection will be more rewarding if it was based on such traits.

The fruit yield per plant (g) had significant positive correlation with traits like plant height (cm), number of primary branches per plant, number of nodes on main stem, intermodal length (cm), number of fruits per plant, fruit length (cm), fruit girth (cm), number of pickings and picking duration (days) suggesting the importance of these traits in the selection for yield and can be identified as yield attributing characters for the genetic improvement of yield in okra.

The fruit yield per plant (g) was a result of direct effect of intermodal length (cm), fruit length (cm), days to first picking, petiole length (cm), picking duration (days), node at which first flower appeared, fruit girth (cm), number of pickings and number of nodes on main stem. The high direct effect of these traits appeared to be the main factor for their strong association with total fruit yield per plant (g).

Analysis for divergence using $D^2$ statistic revealed highly significant differences for different traits, grouping the twenty eight genotypes and two checks into 6 clusters. Cluster I had the maximum number of genotypes (14) followed by cluster III (7). Maximum inter cluster distance was observed between clusters V and VI while the intra cluster distance was maximum in cluster IV. Highest percent contribution to divergence came from YVMV infestation percentage, leaf area and fruit yield per plant. The data on inter cluster distances suggested that selection of one or two elite genotypes from divergent (V & VI) and (IV & VI) clusters based on the above characters and crossing them would result in more heterotic and novel hybrids in okra.


ABSTRACT

The research work entitled “Studies on the effect of post harvest treatments, modified and active packing methods on shelf life and quality of banana cv. grand
naine.” was conducted at Post Harvest Laboratory, College of Horticulture, Dr. Y.S.R Horticultural University, Rajendranagar, Hyderabad during the year 2014-2015. The objectives of the experiment were to study the effect of post harvest treatments on shelf life and quality of banana cv. Grand Naine and other objective is to study the effect of modified and active packaging on shelf life and quality of banana cv. Grand Naine.

First experiment was carried out with ten treatments and second experiment with nine treatments in Completely Randomized Design and replicated thrice. Various physical parameters like PLW (%), fruit firmness (kg/cm²), pulp to peel ratio, colour development, spoilage, shelf-life (days) and physico-chemical parameters like TSS (%B), acidity (%), brix acid ratio and sugars (reducing, total and non reducing) (%), were estimated at 3 days interval.

With respect to the first experiment, banana fruits dipped in Gibberellic acid at 150 ppm retained good colour and recorded significantly lowest PLW (10.01 %), pulp to peel ratio (2.28), spoilage (26.17 %), TSS (19.91 °B), brix acid ratio (36.88) and sugars (reducing, total and non reducing) (7.72, 16.50 and 8.78 %) and significantly highest fruit firmness (2.52 kg/cm²), acidity (0.54 %), shelf life up to 20.23 days. The fruits kept under control recorded the shelf life up to 9 days only.

From the second experiment, it was recorded that fruits packed in low density poly ethylene (LDPE) + ethylene scrubber (KMoNa) retained good colour, recorded significantly minimum PLW (1.11 %), pulp to peel ratio (2.45), spoilage (23.00 %), TSS (17.03 °B), brix-acid ratio (34.06) and sugars (reducing, total and non reducing) (10.20, 15.52 and 5.32 %) and at the same time it has showed significantly highest fruit firmness (2.55 kg/cm²), acidity (0.50 %), and shelf life up to 26.05 days respectively.

247) “Standardization of seed rhizome size and plant spacing for ginger (Zingiber officinale Rose.) cv.Maran under coconut and mango cropping.”- B. Mahender.

ABSTRACT

The present experiment is a series of two separate experiments conducted simultaneously under coconut and mango cropping system during May to December-2014 at Horticultural College and Research Institute farm, Dr.Y.S.R. Horticultural University, Anantharajupet, Y.S.R. Dist., Andhra Pradesh. Each experiment was laid out in a randomized block design with factorial concept with three seed rhizome sizes of ginger viz., 20 g, 30 g and 40 g and five plant spacings viz., 25 cm X 15 cm, 25 cm X 25 cm, 30 cm X 20 cm, 30 cm X 30 cm and 40 cm X 20 cm. Fifteen treatment combinations were replicated thrice.

Under coconut cropping system, among the seed rhizome sizes, rhizome size of 40 g recorded maximum number of tillers per plant (2.97, 10.55 and 11.51), plant height (16.68 cm, 43.25cm and 67.87 cm) and number of leaves per plant (12.01, 104.52 and 115.36) at 30, 120 DAP and at harvest. Leaf length, leaf breadth, leaf area and leaf area index were found to be significantly maximum under 40 g seed rhizome size (18.94 cm, 2.07 cm, 21.70 cm² and 3.59 respectively). Similarly 40 g seed rhizome size took least number of days to first sprouting and 50 percent sprouting. Among yield and yield attributing parameters, rhizome length (15.82 cm), rhizome breadth (15.89 cm), yield per plant (204.01 g), yield per plot (3.29 kg), yield per hectare (27.41 t) and harvest index (61.53%) were found to be maximum with 40 g rhizome size. Quality
parameters viz., essential oil content (1.83%), oleoresin content (7.87%), starch content (30.36%) and crude fibre content (4.90%) were also observed to be maximum from 40 g seed rhizome size.

Similarly under mango cropping system seed rhizome size of 40 g recorded maximum number of tillers per plant (3.24, 8.57 and 12.25), plant height (22.17 cm, 63.33 cm and 97.93 cm) and number of leaves per plant (16.24, 93.61 and 137.47) at 30, 120 DAP and at harvest. Leaf length, leaf breadth, leaf area and leaf area index were found to be significantly maximum from 40 g seed rhizome size (23.71 cm, 2.46 cm, 28.18 cm² and 4.57 respectively). Days to first sprouting and days to 50 percent sprouting was lowest from 40 g rhizome size. Among yield and yield attributing parameters, maximum rhizome length (17.03 cm), rhizome breadth (17.16 cm), yield per plant (206.88 g), yield per plot (3.08 kg), yield per hectare (25.69 t) and harvest index (60.35%) were recorded with 40 g rhizome size. Quality parameters were also observed to be maximum from 40 g seed rhizome size.

Among different plant spacings, 30 cm X 30 cm spacing showed maximum values for number of tillers per plant (2.64, 10.93 and 11.64) and number of leaves per plant (10.69, 104.47 and 106.09) at 30, 120 DAP and at harvest under coconut cropping system. Leaf length, leaf breadth and leaf area (18.96 cm, 2.09 cm and 22.13 cm²) were highest with 30 cm X 30 cm spacing. However, highest leaf area index (5.25) was recorded from spacing of 25 cm X 15 cm. Days to first sprouting (12.78) and days to 50% sprouting (20.67) were reported to be lowest from 30 cm X 30 cm spacing. However, the plant height was highest (16.34 cm, 42.47 cm, and 65.07 cm) from a closer spacing of 25 cm X 15 cm at 30, 120 DAP and at harvest. With regard to yield and yield attributing parameters, maximum rhizome length (14.90 cm), rhizome breadth (14.67 cm) and yield per plant (203.02 g) were observed from a wider spacing of 30 cm X 30 cm. Whereas, yield per plot (3.17 kg), yield per hectare (26.40 t) and harvest index (60.37%) were recorded from closest spacing of 25 cm X 15 cm. Quality parameters were also found to be good under 30 cm X 30 cm spacing.

Similarly under mango cropping system, 30 cm X 30 cm spacing showed maximum values for number of tillers per plant (3.00, 8.36 and 12.36) and number of leaves per plant (14.64, 97.02 and 135.20) at 30, 120 DAP and at harvest. Leaf characters were highest with 30 cm X 30 cm spacing. However, leaf area index (6.61) was highest from spacing of 25 cm X 15 cm. Days to first sprouting (10.11) and days to 50% sprouting (19.11) were minimum from 30 cm X 30 cm spacing. Plant height was maximum (21.20 cm, 63.40 cm, and 98.20 cm) from a closer spacing of 25 cm X 15 cm at 30, 120 DAP and at harvest. Maximum rhizome length (16.54 cm), rhizome breadth (17.12 cm) and yield per plant (200.93 g) were observed from a wider spacing of 30 cm X 30 cm. Whereas, yield per plot (3.09 kg), yield per hectare (25.77 t) and harvest index (58.93%) were recorded from closest spacing of 25 cm X 15 cm. The data on quality parameters showed indifferent values with plant spacing.

Among the interactions 40 g seed rhizome size with 30 cm X 30 cm plant spacing recorded highest yield per plant (215.40 g and 220.80 g) under both coconut and mango cropping system respectively. However rhizome yield per plot and yield per hectare were found to be maximum (4.57 kg, 38.06 t and 3.67 kg, 30.56 t) from a closer spacing of 25 cm X 15 cm with 40 g seed rhizome size.

The highest benefit cost ratio of 4.68 and 4.30 were obtained with 20 g rhizome size with 40 cm X 20 cm spacing and 20 g rhizome size with 30 cm X 20 cm spacing under coconut and mango cropping system respectively.

ABSTRACT

The present investigation entitled “Effect of pretreatments and drying methods on quality and storage life of onion rings” was carried out at College of Horticulture, Rajendranagar, Hyderabad during 2014-15. The experiment was carried out in Factorial completely Randomized Design consisting of pretreatments and drying methods as first factor i.e. solar drying (T1), sun drying (T2), Electric drying (T3), salt (2%) + solar drying (T4), salt (2%) + sun drying (T5), salt (2%) + electric drying (T6), KMS (0.25%) + solar drying (T7), KMS (0.25%) + sun drying (T8), KMS (0.25%) + electric drying (T9), KMS (0.25%) + salt (2%) + solar drying (T10), KMS (0.25%) + salt (2%) + sun drying (T11), KMS (0.25%) + salt (2%) + electric drying (T12) and different months after storage i.e. initial (M0), 1 MAS (M1), 2 MAS (M2), 3 MAS (M3), 4 MAS (M4) as second factor and were replicated thrice.

Onion rings pre-treated with KMS (0.25%) and dried in electric dryer recorded maximum recovery %, reconstitutability ratio, ascorbic acid, total polyphenols, organoleptic score for texture, colour and appearance and overall acceptability with minimum non enzymatic browning except for dehydration ratio (KMS @0.25% + open sun drying), rehydration ratio (KMS @ 0.25% + solar drying), reducing and total sugars (solar drying without any pre-treatment), non reducing sugars (electric drying without any pre-treatment), pyruvic acid, minimum moisture (salt @ 2% + electric drying) and total flavonoid content (open sun without any pre-treatment) and taste and flavour (salt @ 2% + solar drying).


ABSTRACT

The present investigation entitled “Evaluation of radish (Raphanus sativus L.) cultivars for growth, yield and quality traits in coastal Andhra Pradesh” was conducted during the period of rabi, at Horticulture College and Research Institute, Dr. Y.S.R Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh. The major objectives were to find out the most suitable cultivars of radish under local agro-climatic conditions and to analyze variability, correlation and path coefficients for various quantitative and qualitative traits.

The experiment was laid out in RBD with fourteen cultivars viz., Anantnag Red Round, Arka Nishanth, Chinese Pink, Dronagiri, Japanese White Long, NRD 42, Rapid Red White Top, Pusa Chetki, Pusa Gulabi, Pusa Jamuni, Pusa Mridula, White Icicle, White Round and Local cultivar (Check) in three replications. Observations were recorded for twenty one characters of which nine are vegetative characters viz., days to germination, germination percentage (%), plant height (cm), number of leaves per plant, leaf area (cm$^2$), leaf length (cm), leaf width (cm) and leaf weight (g), eight are yield characters viz., root length (cm), root to shoot ratio, root diameter (cm), girth of the root (cm), root weight(g), plant weight (g), number of days to harvest, root yield (t ha$^{-1}$) and plant yield(t ha$^{-1}$) and four are quality characters viz., total dry matter of roots (%), total soluble solids(Brix),moisture content (%) and ascorbic acid(mg100g$^{-1}$).
The analysis of variance revealed significant differences among the cultivars for all the characters studied indicating that the cultivars selected for the investigation had wider variability. Wide and significant variations for all the characters were observed among the varieties evaluated for high yield. Based on the mean performance, Japanese White Long recorded maximum root yield, plant yield, root weight, plant weight, leaf weight, days to harvest, total soluble solids and ascorbic acid. Arka Nishanth recorded maximum plant height at 20 DAS, leaf area, leaf length and leaf width. Pusa Chetki recorded highest germination percentage, plant height at harvest and moisture content. Maximum number of leaves per plant was recorded in Local cultivar (check). The longest root and total dry matter of root was recorded in NRD 42. White Icicle recorded maximum root to shoot ratio. Maximum root girth was recorded in White Round. Anantnag Red Round recorded lowest plant yield, number of days to germination, root to shoot ratio and plant weight. Dronagiri recorded minimum lowest germination percentage and ascorbic acid. While Pusa Mridula recorded minimum root yield, number of leaves per plant, leaf area, leaf weight, root weight and days to harvest.

The genotypic coefficient of variation for all the characters studied were lesser than the phenotypic coefficient of variation indicating the modifying effect of the environment in association with the characters at genotypic level. Higher magnitude of PCV and GCV (> 20%) were observed for plant height at 20 DAS (cm), leaf length, leaf weight (g), root to shoot ratio, girth of the root (cm), root weight (g), plant weight (g) and root yield (t ha⁻¹), plant yield (t ha⁻¹) indicating the existence of wide range of genetic variability in the cultivars for these traits.

High heritability ($h^2$) estimates (>60%) coupled with high estimates from genetic gain as percent of mean (>20%) were observed for germination percentage, plant height at 20 DAS (cm), number of leaves per plant, leaf area (cm²), leaf length (cm), leaf width (cm), leaf weight (g), root length (cm), root to shoot ratio, root diameter (cm), girth of the root (cm), root weight (g), plant weight (g), days to harvest, root yield (t ha⁻¹), plant yield (t ha⁻¹), total dry matter of roots (%), total soluble solids (°Brix) and ascorbic acid (mg 100g⁻¹) which indicated that most likely the heritability is due to additive gene effects and thus the chances of fixing by selection are more to improve such traits through mass selection, progeny selection, hybridization and selection through pedigree breeding.

Correlation study indicated that genotypic correlation coefficients were higher than phenotypic correlation coefficients indicating lesser phenotypic expression under the influence of environment. Root yield had positive genotypic and phenotypic correlation level with plant yield, total soluble solids, plant weight, leaf number, leaf weight, root length, root to shoot ratio and root weight.

Path coefficient analysis revealed that germination, germination percentage, leaf weight, root length, root girth, root weight, plant yield, total dry matter, total soluble solids, moisture content and ascorbic acid had positive effect with root yield. Root yield had high positive direct effect with root girth and high negative direct effect with root to shoot ratio.

Based on the observations on yield and root weight the varieties Japanese white long, Arka Nishanth and NRD 42 can be recommended for cultivation in coastal districts of Andhra Pradesh.


ABSTRACT

The present investigation entitled “Studies on preparation of protein and β-carotene rich guava fruit bar” was carried out in a set of two experiments during 2014-15 at College of Horticulture, Rajendranagar, Hyderabad. The objective of this study was to develop an
attractive coloured, protein, β-carotene rich and highly palatable fruit bar from ‘Allahabad safeda’ variety of guava. In the first experiment, seven guava fruit bars were prepared as per FPO specifications by adding defatted soy flour (DFS), skim milk powder (SMP) and carrot puree in different concentrations. The seven samples of fruit bar were dried in solar powered cabinet dehydrator (SDM-50) for 48 hours.

The physico-chemical characters, organoleptic qualities & microbial counts were recorded initially in seven fruit bar recipes. The guava fruit bar with composition of 84% pulp, 6% Skim milk powder (SMP) and 10% carrot puree (T4) had maximum TSS, reducing sugars, total sugars and preferred moisture content (16-20%) with minimum acidity and good retention of β-carotene content. The next best was guava fruit bar with composition of 86% guava pulp, 4% SMP (Skim milk powder) and 10% carrot puree (T3). Initially no yeast or moulds were recorded in any of the freshly prepared fruit bars.

Though, the fruit bar with 84% guava pulp, 6% DFS (Defatted soy flour) and 10% carrot puree (CP) had high protein content, the two fortified fruit bars viz., guava fruit bar with composition of 84% pulp, 6% Skim milk powder (SMP) and 10% carrot puree (T4), guava fruit bar with composition of 86% guava pulp, 4% SMP (Skim milk powder) and 10% carrot puree (T3) got better score in sensory evaluation. Thus based on the sensory scores these two fortified fruit bars were selected for storage stability for 3months under ambient conditions.

In the second experiment, the two fruit bar recipes T1- Guava- SMP fruit bar with composition of 86% guava pulp, 4% Skim milk powder & 10% Carrot puree and T2- Guava- SMP fruit bar with composition of 84% guava pulp, 6% Skim milk powder & 10% Carrot puree with better quality; textural and sensory properties were selected and assessed for storage stability. The bars were packed in four different packing materials viz., LDPE (low density polyethylene), HDPE (high density polyethylene), PP (polypropylene), MP (metallised polyester) and the bar, without packing was taken was kept as control. The fruit bars were stored under ambient conditions (27±1°C and 60% RH) and the physico-chemical characters, organoleptic qualities & microbial counts were recorded initially & at monthly intervals upto 90 days.

The moisture content, TSS, total sugars of fruit bars increased and there was a slight decrease in pH, ascorbic acid, β-carotene, protein and reducing sugars in the fruit bar samples packed in different packing materials and stored at ambient conditions up to 90 days of storage. The fruit bars packed in metallised polyester had highest percentage of nutrient retention and no microbial count was recorded upto 3 months of storage. In other packing materials the microbial count was observed from 60th day of storage and increased with increase in storage period; however the products were found safe for consumption.

Among the two fruit bars in the treatments T1 & T2 , the Guava- SMP fruit bar with composition of 84% guava pulp, 6% Skim milk powder & 10% Carrot puree (T2) packed in metallised polyester had highest rating for sensory attributes like colour, flavor, taste, texture and overall acceptability after 90 days of storage under ambient storage. On contrary the Guava- SMP fruit bar with composition of 86% guava pulp, 4% Skim milk powder & 10% Carrot puree (T1) had slightly higher nutritional value than T2. Thus it can be inferred from the study that, based on the sensory evaluation scores the fortified fruit bar of guava with 84% pulp, 6% SMP and 10% carrot puree (T4) was rated as the best when packed in metalized polyester upto 90 days of storage under ambient conditions. Thus the study revealed that highly nutritionally guava fruit bar can be prepared by supplementing with protein & β-carotene.
which can combat malnutrition. To increase customer demand, further research can be enhanced on usage of nutritionally & coloured fruits for preparation of fruit bars.

251) “Standardization of potting media for growth, yield and vase life of gladiolus cultivars in Rayalaseema region of Andhra Pradesh”- K. Saradha.

ABSTRACT

The present investigation entitled “Standardization of potting media for growth, yield and vase life of gladiolus cultivars in Rayalaseema region of Andhra Pradesh” was carried out at Horticultural College and Research Institute, Anantharajupet during the year, 2014-15. The experiment was laid out in factorial randomized block design replicated thrice with three cultivars and eleven potting media combinations.

The results on vegetative parameters revealed that among potting media combinations, T₂ (soil 50% + cocopeat 50%) recorded maximum plant height (56.27 and 89.04 cm), maximum number of leaves (15.22, 8.56) at 30, 60 DAP and maximum number of leaves (8.95), maximum leaf length (83.13 cm) at harvest. Among cultivars, Bindya (V₂) recorded maximum plant height (49.72 and 78.03 cm) at 30, 60 DAP, maximum number of leaves (7.44) at 60 DAP. Maximum number of leaves (7.56), maximum leaf length and leaf width at harvest (90.08 and 3.29 cm), whereas Arka Amar (V₁) recorded maximum number of leaves (11.56) at 30 DAP and among interactions, V₁T₂ (Bindya with soil 50% + cocopeat 50%) recorded maximum plant height (61.23 cm), whereas maximum number of leaves (16.56) was recorded in V₁T₂ (Arka Amar with soil 50% + cocopeat 50%) at 30 DAP.

Significant variations were observed among potting media with respect to floral parameters. T₂ (soil 50% + cocopeat 50%) recorded minimum number of days taken for spike initiation, full emergence of spike, first floret to show colour and first floret to open (63.04, 67.22, 70.05 and 75.02 days respectively), maximum rachis length (49.37 cm), maximum number of florets per spike (10.89) and longevity of spike on plant and vase life (12.22 and 6.59 days), whereas maximum spike length (61.23 cm) was recorded in T₈ (soil 50% + cocopeat 25% + FYM 25%) and maximum diameter of first floret (11.63 cm) was observed in T₃ (soil 75% + FYM 25%). Among cultivars, Bindya (V₂) recorded maximum spike length, rachis length, diameter of first floret and number of florets per spike (57.05, 39.96, 11.97 cm and 8.97 respectively), whereas V₁ (Arka Amar) recorded maximum vase life and longevity of spike on plant (5.78 and 9.73 days). The interaction, V₁T₂ (Arka Amar with soil 50% + cocopeat 50%) recorded maximum rachis length (52.87 cm), maximum vase life and longevity of spike on plant (7.22 and 13.33 days), whereas maximum spike length (65.51 cm) was recorded in V₂T₈ (Bindya with soil 50% + cocopeat 25% + FYM 25%). Maximum number of florets per spike (13.00) were recorded in V₂T₂ (Bindya with soil 50% + cocopeat 50%) and maximum diameter of first floret (13.04 cm) was in V₂T₅ (Bindya with soil 75% + FYM 25%).

With regard to corm parameters, among potting media combinations, maximum number of corms & cormels per plant (1.93 and 24.37), maximum diameter of corms & cormels (6.58 and 1.51 cm) and maximum weight of corms & cormels (104.50 and 30.90 g) was recorded in T₂ (soil 50% + cocopeat 50%). Among cultivars, Arka Amar recorded maximum number of corms & cormels (1.97 and 27.84) per plant, maximum weight of cormels (30.55 g), whereas Bindya (V₂) recorded maximum weight of corms, diameter of corm & cormel (114.28 g and 7.20, 1.35 cm). The interaction of cultivars & potting media revealed that V₁T₂ (Arka Amar with soil 50% + cocopeat 50%) resulted in maximum number of corms, cormels (2.71 and
33.44) per plant and weight of cormels (36.36 g), whereas $V_2T_2$ (Bindya with soil 50% + cocopeat 50%) recorded maximum weight of corms and corm diameter (124 g and 7.60 cm).

With regard to yield and economics, among potting media, $T_2$ (soil 50% + cocopeat 50%) recorded maximum yield of spikes per plant (2.22) and among cultivars, $V_1$ (Arka Amar) recorded maximum yield (1.69) and interaction $V_1T_2$ (Arka Amar with soil 50% + cocopeat 50%) and $V_1T_{10}$ (Arka Amar with soil 25% + cocopeat 25% + vermicompost 25% + FYM 25%) recorded maximum yield (2.67) in number of spikes per plant.

There was significant difference among treatments with respect to B:C ratio, $V_1T_{10}$ (Arka Amar with soil 25% + cocopeat 25% + vermicompost 25% + FYM 25%) recorded maximum net returns (Rs. 3,38,038 ha$^{-1}$) with higher B:C ratio (2.37) followed by $V_1T_2$ (Arka Amar with soil 50% + cocopeat 50%) (Rs. 3,33,493 ha$^{-1}$) with B:C ratio (2.26), whereas minimum net returns (Rs. 43,801 ha$^{-1}$) with lower B:C ratio (0.32) in $V_2T_1$ (Bindya with soil 75% + cocopeat 25%).

252) “Response of palmarosa (Cymbopogon martinii Stapf) to different levels of fly ash and vermicompost”- Gaddam Sharon Rose

ABSTRACT

The present investigation entitled “Response of palmarosa (Cymbopogon martinii Stapf) to different levels of fly ash and vermicompost” was carried out at Central Institute of Medicinal and Aromatic Plants (CIMAP), Boduppal, Hyderabad during 2014-15. The experiment was carried out in Randomized Block Design with three replications.

This experiment was conducted with an objective to find out the effect of fly ash and vermicompost on growth and herb yield of palmarosa, content and composition of essential oil of palmarosa and nutrient status of plant and soil in two crops/harvests.

Thirteen treatments were imposed with different combinations of fly ash and vermicompost. The treatments were $T_1$ – Fly ash (0 t/ha) + Vermicompost (10 t/ha), $T_2$ – Fly ash (1 t/ha) + Vermicompost (9 t/ha), $T_3$ – Fly ash (2 t/ha) + Vermicompost (8 t/ha), $T_4$ – Fly ash (3 t/ha) + Vermicompost (7 t/ha), $T_5$ – Fly ash (4 t/ha) + Vermicompost (6 t/ha), $T_6$ – Fly ash (5 t/ha) + Vermicompost (5 t/ha), $T_7$ – Fly ash (6 t/ha) + Vermicompost (4 t/ha), $T_8$ – Fly ash (7 t/ha) + Vermicompost (3 t/ha), $T_9$ – Fly ash (8 t/ha) + Vermicompost (2 t/ha), $T_{10}$ – Fly ash (9 t/ha) + Vermicompost (1 t/ha), $T_{11}$ – Fly ash (10 t/ha) + Vermicompost (0 t/ha), $T_{12}$ – RDF (100-40-40 NPK kg/ha) and $T_{13}$ – (Zero fertilizer). The data was recorded on plant height (cm), number of tillers, number of leaves, leaf area (cm$^2$), dry matter (%), herb yield (t/ha), essential oil content(%), essential oil composition(%), N, P and K of soil (kg/ha) and N, P and K of plant (%) for two crops.

In the present study, among all the treatments, $T_7$ (FA 6 t/ha + VC 4 t/ha) recorded significantly maximum plant height (151.62 cm), number of tillers (78), number of leaves (491), leaf area (33.98 cm$^2$), dry matter (50.95%) and herb yield (11.29 t/ha) at first harvest. Similar results were observed in the second harvest i.e. at 180 days. Among all the treatments, $T_7$ (FA 6 t/ha + VC 4 t/ha) recorded significantly maximum plant height (121.29 cm), number of tillers (62), number of leaves (393), leaf area (27.18 cm$^2$), dry matter (40.76%) and herb yield (9.03 t/ha). The treatment $T_7$ remained on par with $T_6$, $T_8$, $T_9$, $T_{10}$ and $T_{11}$ treatments for all the parameters recorded. Essential oil content and composition were found to be non
significant for all the treatments in both harvests. Soil N (414.61 kg/ha and 372.42 kg/ha) and P (29.32 kg/ha and 21.56 kg/ha) values recorded highest in T1 (FA 0 t/ha + VC 10 t/ha) while highest soil K (558.25 kg/ha and 542.13 kg/ha) was recorded by T11 (FA 10 t/ha + VC 0 t/ha) at first and second harvest, respectively. The soil N gradually decreased from T1 to T11, while soil K increased from T1 to T11. Highest plant N (2.14% and 2.03%), P (0.32% and 0.30%) and K (4.23% and 3.79%) were recorded at 90 and 180 days, respectively in T7. The treatment T7 remained on par with T6, T8, T9, T10 and T11 for N, P and K of plant. The results from the experiment demonstrated that, among the different treatments the treatment T7 with fly ash and vermicompost at 6 t/ha and 4 t/ha, respectively may be consiered as the best treatment followed by T6, T8, T9, T10 and T11 treatments for obtaining higher growth, herb yield and nutrient status of plant in palmarosa.

253) “Effect of different levels of fly ash and vermicompost on growth and yield of lemongrass (Cymbopogon flexuosus Nees)”- Puli Srinivas.

ABSTRACT

The present investigation was undertaken to study the effect of different levels of fly ash and vermicompost on growth and yield of lemongrass (Cymbopogon flexuosus nees) during the year 2014-2015 at Central Institute of Medicinal and Aromatic Plants (CIMAP), Boduppal, Hyderabad. The experiment was carried out in Randomized Block Design with three replications.

The treatments used were thirteen with different combinations of fly ash and vermicompost. The treatments were Fly ash 0 t/ha + Vermicompost 10 t/ha (T1), Fly ash 1 t/ha + Vermicompost 9 t/ha (T2), Fly ash 2 t/ha + Vermicompost 8 t/ha (T3), Fly ash 3 t/ha + Vermicompost 7 t/ha (T4), Fly ash 4 t/ha + Vermicompost 6 t/ha (T5), Fly ash 5 t/ha + Vermicompost 5 t/ha (T6), Fly ash 6 t/ha + Vermicompost 4 t/ha (T7), Fly ash 7 t/ha + Vermicompost 3 t/ha (T8), Fly ash 8 t/ha + Vermicompost 2 t/ha (T9), Fly ash 9 t/ha + Vermicompost 1 t/ha (T10), Fly ash 10 t/ha + Vermicompost 0 t/ha (T11), RDF (100-40-40 NPK Kg/ha)(T12), Zero fertilizer (T13).

This experiment was conducted with an objective to find out the effect of fly ash and vermicompost on growth and herb yield, content and composition of essential oil and nutrient status of soil and plant of lemongrass. The data was recorded on plant height (cm), number of tillers, number of leaves, leaf area (cm$^2$), dry matter (%), herb yield (t/ha), essential oil content (%), essential oil composition (%), N, P and K of soil (Kg/ha) and N, P and K of plant (%) for two crops.

From the study the results enunciated that among the treatments, T7 (FA 6 t/ha + VC 4t/ha) recorded significantly maximum plant height (154.6 cm and 123.7 cm), number of tillers (42 and 54), number of leaves (142 and 182), leaf area (207.4 cm$^2$ and 159.4 cm$^2$), dry matter (31.5 % and 27.8 %), herb yield (17.8 t/ha and 13.7 t/ha) at 90 and 180 days, respectively. Non significant differences were observed for essential oil content and composition. Soil N, P, K values recorded highest in T7. N has gradually decreased from T1 to T11 while K has increased from T1 to T11. Highest plant N (2.46 % and 2.07 %), P (0.38% and 0.33 %) and K (3.4 % and 3.52 %) were recorded at 90 and 180 days, respectively in T7. The treatment T7 remained on par with T6, T8, T9, T10 and T11 treatments for obtaining higher growth, herb yield and nutrient status of plant in palmarosa.
The results from the experiment demonstrated that among the different treatments the treatment $T_7$ with fly ash 6 t/ha and vermicompost 4 t/ha may be considered as the best treatment obtaining higher plant growth, herb yield and oil content of lemongrass.

254) “Performance of radish (Raphanus sativus L.) Varieties with different dates of sowing in southern agro climatic zone of Andhra Pradesh” -M.Priyanka

ABSTRACT

The present investigation entitled “Relative performance of radish (Raphanus sativus L.) Varieties under different dates of sowing in southern agro climatic zone of Andhra Pradesh” was carried out during rabi season of 2014-15 at Horticulture College and Research Institute, Dr.Y.S.R. Horticultural University, Anantharajupet, Y.S.R. District of Andhra Pradesh.

The experiment was laid out in randomized block design with factorial concept with four varieties of radish viz., Local variety, Arka Nishant, Japanese White and Pusa Chetki and four sowing dates viz., second fortnight of July, first fortnight of August, second fortnight of August and first fortnight of September. There were sixteen treatment combinations replicated thrice. Observations were recorded on growth parameters, yield and yield attributes and quality parameters. The data recorded on plant growth parameters revealed that maximum germination percentage (91.33%), plant height (19.97 cm at 30 DAS and 49.78 cm harvest) and shoot weight (116.75 g) were observed in the variety, Japanese White (V3), whereas in the variety Arka Nishant (V2), maximum number of leaves plant-1 (28.65), leaf length (36.90 cm), leaf width (11.53 cm) and leaf area (221.76 cm$^2$) were recorded. In relation to yield and yield attributes, root length (20.40 cm), root diameter (4.70 cm), root weight (186.15 g), fresh weight of the plant (276.43 g) and root yield (3.14 kg plot-1 and 69.68 q ha-1) were recorded in Japanese White (V3), whereas Local variety (V1) recorded maximum root to shoot ratio (1.97). In respect of quality traits, the variety Local (V1) recorded highest ascorbic acid content (21.26 mg 100 g$^{-1}$) and root splitting cracking (59.50%). Sowing during first fortnight of September (S4) recorded maximum germination percentage (96.42%), plant height (17.50 cm at 30 DAS and 49.77 cm at harvest), leaf length (29.60 cm), leaf width (14.44 cm), leaf area (177.22 cm$^2$) and shoot weight (148.08 g). The highest root length (17.61 cm), diameter (5.36 cm), root weight (227.55 g), fresh weight of the plant (384.83 g), days to 15 maturity (56.17) and root yield (3.53 kg plot-1 and 78.34 q ha-1) were recorded in first fortnight of September (S4) sowing which was superior to all other dates of sowing and the root to shoot ratio (1.94) was highest with second fortnight of July (S1) sowing. Significantly maximum ascorbic acid content (18.13 mg 100 g$^{-1}$), TSS (3.39 0Brix), root forking (62.92%) and root splitting and cracking (94.42%) was recorded with second fortnight of August (S3).

The interaction effect between varieties and sowing dates of radish was significant for all the characters except for leaf width and root forking. Maximum germination percentage (98.33%), plant height (24.98 cm at 30 DAS and 60.54 cm at harvest) and shoot weight (211.14 g) was obtained with Japanese White sown during first fortnight of September (V3S4), while in Arka Nishant maximum number of leaves plant-1 (36.90), leaf length (36.90 cm) and leaf area (245.33 cm$^2$) were recorded with first fortnight of September (V2S4) sowing. Among the yield and yield attributes, Japanese White recorded highest root length (25.62 cm), diameter (7.77 cm), root weight (358.13 g), fresh weight of the plant (484.93 g) and root yield (4.27 kg plot-1 and 94.80 q ha-1) with first fortnight of September sowing. Maximum root to shoot ratio (2.44) was recorded with Pusa Chetki sown during second fortnight of July (V4S1), whereas
Arka Nishant took more number of days to maturity (62.00) with first fortnight of September (V2S4) sowing. In relation to quality parameters, Local variety recorded highest ascorbic acid (23.61 mg100 g-1) with first fortnight of August (V1S2) sowing, while Arka Nishant recorded maximum TSS (4.11 0Brix) with second fortnight of August (V2S3) sowing and maximum root splitting and cracking (96%) was recorded with Pusa Chetki sown during second fortnight of August (V4S3).

Based on the results of the study, it was concluded that radish varieties, Japanese White and Arka Nishant were best suited for growing in southern agro climatic zone of Andhra Pradesh and the ideal time for sowing these varieties is during second fortnight of August and first fortnight of September, respectively.

255) “Influence of sowing date and variety on growth, yield and quality of fenugreek”- B.Anitha

ABSTRACT

An investigation was conducted at Horticultural College and Research Institute, Venkataramannagudem, Dr.YSR Horticultural University with an objective of evaluating the effect of sowing date, variety and their interaction on growth, yield and quality of seed fenugreek in order to assess its fitment into sequence cropping under delayed sowing conditions. A total of five varieties viz., Hissar Sonali, Rmt-1, Co-1, Rajendrakranti and Co-2 were evaluated on five sowing dates at 15-day interval starting from 15th October to 15th December in split plot design with five main plots as sowing dates and five sub-plots as varieties.

There were significant differences in the vegetative or growth parameters at all growth stages i.e. 30, 60 DAS and at maturity. Plant height, number of branches, number of leaves and plant spread were maximum in 15th October sown plants and minimum in 15th December sown plants. Some of these parameters had no significant difference between 15th October and 1st November, and 1st December and 15th December as well. However, among the varieties tested Co-1 was found to record maximum values in respect of many of the growth parameters. The variety was on par with Co-2 in case of certain characters. Fresh weight of plant, Dry weight of plant and leaf area per plant was found to record maximum values in Co-1 variety sown on 15th October. They were found to be at par with Co-2 variety sown on the same time. However, the minimum values in respect of them were recorded by Rmt-1 sown on 15th December and 1st December.

An examination of flowering parameters revealed that maximum delay in flowering was exhibited by 15th October sown plants belonging to Co-1 variety and Co-2 variety showing that they were vested with a prolonged growth cycle. As compared to early sown crop, late sown fenugreek exhibited an earlier onset of flowering but led to the production of significantly lesser number of pods and lesser quantity of seed yield per plant and per plot on account of shorter growth cycle and premature transition into reproductive phase.

The results on yield parameters indicated that the seed yield was in the decreasing order of Co-1, Co-2, Hissar Sonali, Rajendrakanthi and Rmt -1. With respect to dates of sowing 15th October sown crop recorded the maximum seed yield as compared to late sown crop. A comparison with the other yield attributing parameters like number of pods per plant, weight of pods per plant, number of seeds per pod and shelling percentage also established that Co-1 and Co-2 varieties sown on 15th October exhibited maximum values in respect of many of these parameters. It is also observed that Co-1 and Co-2 varieties were at par in some of these
characters and on the other hand at lower level Rmt-1 and Rajendrakanthi were on par with one another. Regarding the sowing dates 15th October was found to be on par with 1st November and similarly 1st December and 15th December were also on par though recorded minimum values in respect of some of the characters including seed yield per plant and per plot.

Visible quality parameters like size of pod, weight of pod, filling percentage of seeds, shelling percentage, 1000-seed weight etc were found to be highest in the 15th October sown crop and Co-1 variety as well as their combination. As regards to chemical quality, total chlorophyll content and chlorophyll a to chlorophyll b ratio were significantly influenced by sowing date, variety and their interaction. The widest ratio of chlorophyll a to chlorophyll b was observed by the October sown crop and Co series varieties as compared to others. Similarly protein content and diosgenin content was also found to be highest in the October sown crop and Co series varieties as compared to rest of the sowing dates and varieties.


ABSTRACT

The present investigation on “Standardization of preparation of jackfruit bar and osmodehydrated slices using electrical dehydrator and solar dryer” was carried out during 2014-15 at Horticultural Research Station, Venkataramannagudem. A set of two experiments were carried out to study the quality and storage life of jackfruit bar and osmodehydrated slices. Different concentrations of sugar and citric acid and two drying methods (solar dryer and electrical dehydrator) were used to standardize the preparation and study the shelf life of the two products using Palur-1 variety.

The experiment was carried out in completely randomized block design with factorial concept and treatments were replicated thrice. The physico-chemical and organoleptic qualities of jackfruit bars and osmodehydrated slices were evaluated at 15 days intervals upto 90th day of storage period. It was observed that total soluble solids, reducing sugars, total sugars, titratable acidity, and physiological loss in weight and browning showed increasing trend throughout the storage period where as ascorbic acid, non-reducing sugars, β-carotene content and organoleptic score exhibited decreasing trend during storage of the fruit bar.

Among the treatments, the bar prepared with 20% sugar, 0.3% citric acid and dried in the electrical dehydrator was nutritionally good and based on the sensory evaluation it was more acceptable and recorded highest TSS, total sugars, reducing sugars, titratable acidity, β-carotene, ascorbic acid, organoleptic score and lowest physiological loss in weight and browning and microbial spoilage and it was on par with bar prepared with 20% sugar, 0.4% citric acid and dried in the electrical dehydrator.

Good quality and acceptable osmodehydrated slices could be prepared with 60% sugar and 0.4% citric acid dried in electrical dehydrator which showed better retention of TSS, total sugars, reducing sugars, titratable acidity β-carotene, ascorbic acid, organoleptic score and lowest physiological loss in weight and no microbial spoilage during storage period of 90 days.

When the two drying methods were compared, electrical dehydrator was better and the fruit bar and osmodehydrated slices were more acceptable than the solar drying method. Solar drying is cheaper as it does not require energy, where as the cost of drying in electrical dehydrator is high. It can be inferred from the study, that the flavour, taste and nutritional
quality of fruit bar and osmodehydrated slices prepared in electrical dehydrator were good with acceptable colour where as the products prepared in solar dryer turned brown by 60th day. Hence it can be concluded that electrical dehydrator is better over solar dryer. The jackfruit bar and osmodehydrated slices thus prepared were nutritionally rich, superior in quality attributes and highly acceptable even after three months of storage.

257) “Impact of pusa hydrogel incorporated growing media on growth and yield characters of pot mums (Dendranthema grandiflora L.) under various irrigation regimes”- A. Tarun Kumar.

ABSTRACT

To investigate the influence of Pusa hydrogel incorporated growing media on growth and yield characters of pot mums under various irrigation regimes, an experiment was conducted in the Floricultural Research Station, Rajendranagar, Dr.Y.S.R. Horticultural University in factorial layout based on completely randomized design in three replications. The factors were eight potting media compositions viz; P1:Red earth + FYM + Sand + Vermicompost + Pusa Hydrogel @ 0.1%, P2:Red earth + FYM + Sand + Vermicompost + Pusa Hydrogel @ 0.3%, P3:Red earth + FYM + Sand+ Vermicompost + Pusa Hydrogel @ 0.5%,P4:Red earth + FYM+ Sand + Cocopeat+ Pusa Hydrogel @ 0.1%, P5:Red earth+FYM + Sand + Cocopeat + Pusa Hydrogel @ 0.3%, P6 : Red earth + FYM + Sand + Cocopeat + Pusa Hydrogel @ 0.5%, P7 : Red earth + FYM + Sand + Pusa Hydrogel @ 0.5% , P8 : Red earth + FYM + Sand (control) and three irrigation regimes viz; I1 : 3 days interval, I2 : 6 days interval, I3 : 9 days interval

The statistical analysis of results showed that different concentrations of hydrogels, irrigation intervals and their interaction have influenced the growth and yield parameters of the pot mums. Potting media having composition of vermicompost with 0.5% Hydrogel along with common potting mixture (Red earth+FYM+Sand) has recorded the best results for plant height, plant spread, root and shoot biomass, chlorophyll content, earliness in flowering, flower yield and duration of flowering. Maximum root length was observed in control plants with 9 days irrigation interval. There was no significant difference among the different concentrations of hydrogel in the growing media, irrigation intervals and their interaction, with respect to the vase life of flowers.

The effect of hydrogels and different irrigation intervals on soil properties like bulk density, pH, soil moisture percentage and nutrient content in soil was also studied. Among the different treatments, potting media having composition of vermicompost with 0.5% Hydrogel along with common potting mixture (Red earth+FYM+Sand) has increased the soil moisture percentage, available nutrients (NPK) in soil and decreased the bulk density of soil. Irrigation at 3 days interval has recorded the maximum soil moisture status with minimum bulk density of soil whereas the irrigation at 9 days interval has increased the bulk density of soil with low soil moisture status. Nutrient availability in soil was maximum with irrigation at 9 days interval compared to the 3 days interval. But, no significant changes were observed in soil pH with different hydrogel concentrations, irrigation intervals and their interaction.

Further, the influence of different hydrogel concentrations, irrigation intervals and their interactions on plant physiological characters was recorded. The results revealed that the hydrogels at 0.5% concentration has improved the plant nutrient status, water use efficiency and relative water content whereas control pots having only common potting mixture without any hydrogel recorded the minimum. Among different irrigation intervals, irrigation at 6 days
interval has recorded the best results by increasing the plant nutrient content and relative water content compared to the irrigations at 3 days and 9 days interval whereas the plants with irrigations at 9 days interval proved to be more efficient in water usage compared to others.

The results of this study showed that inclusion of hydrogels in potting media can improve the water availability and reduce the negative effects of water shortage on plants especially that are grown in pots.

258) “Effect of fertigation with water soluble macro nutrients and spraying of chelated micro nutrients on growth, yield and vase life of gerbera (Gerbera jamesonii bolus ex. hook.) under saline water conditions of polyhouse” – N.Suresh.

ABSTRACT

A field experiment entitled “Effect of fertigation with water soluble macro nutrients and spraying of chelated micro nutrients on growth, yield and vase life of gerbera (Gerbera jamesonii bolus ex. hook.) under saline water conditions of polyhouse” was conducted at Floricultural Research Station, Rajendranagar, Hyderabad during Rabi 2013-2014.

The experiment was conducted with different macro (water soluble NPK 100% RDF, water soluble NPK 80% RDF and water soluble NPK 60% RDF) and micro nutrients (rexolin @ 0.5 g per litre, rexolin @ 1 g per litre, rexolin @ 1.5 g per litre and rexolin @ 2 g per litre) levels. The data were recorded on plant height, number of leaves per plant, leaf area, days from flower bud to full flower opening, length of flower stalk, diameter of flower stalk, flower diameter, diameter of disc, diameter of flower neck, number of flowers per plant, number of flowers per square meter and vase life of gerbera with 12 treatments replicated thrice in Split Plot Design.

Among the different levels of macro nutrients, water soluble NPK 100% RDF (F₁) recorded maximum plant height (38.32 cm), number of leaves per plant (22.37), leaf area (150.95 cm²), minimum days from flower bud to full flower opening (10.27 days), length of flower stalk (64.23 cm), diameter of flower stalk (0.745 cm), flower diameter (10.25 cm), diameter of disc (3.46 cm), number of flowers per plant (4.87), number of flowers per meter square (53.62) and vase life (8.27 days).

Among the different levels of micro nutrients, rexolin @ 1 g per litre (M₂) recorded maximum plant height (38.75 cm), number of leaves per plant (22.31), leaf area (149.83 cm²), the minimum days from flower bud to full flower opening (10.13 days), length of flower stalk (65.05 cm), diameter of flower stalk (0.723 cm), flower diameter (10.28 cm), diameter of disc (3.29 cm), number of flowers per plant (5.08), number of flowers per meter square (55.91) and vase life (8.11 days).

Among the interactions, water soluble NPK 100% RDF with rexolin @ 1 g per litre (F₁M₂) recorded maximum plant height (41.41 cm), number of leaves per plant (24.73), leaf area (156.73 cm²), minimum days from flower bud to full flower opening (9.50 days), length of flower stalk (68.50 cm), diameter of flower stalk (0.780 cm), flower diameter (10.61 cm),
diameter of disc (3.82 cm), number of flowers per plant (5.50), number of flowers per square meter (60.50) and vase life (8.75 days).

Our findings concluded that NPK 100% RDF and rexolin @ 1 g per litre were found effective in promoting growth, yield and vase life of gerbera.

259) “Effect of different potting media and plant growth regulators on the growth and establishment of Rangpur lime and Australian sour orange root stock seedlings” – A. Srinivasulu.

**ABSTRACT**

The present study entitled “Effect of different potting media and plant growth regulators on the growth and establishment of Rangpur lime and Australian sour orange root stock seedlings.” was carried out at AICRP on Fruits, CRS, Tirupati, during year 2014-2015. The experiment was laid out in randomized block design replicated thrice with two components as effects of different potting media and growth regulators on Rangpur lime and Australian sour orange seedlings.

In potting media experiment the results indicated that Rangpur lime and Australian sour orange rootstock seedlings recorded maximum plant height, number of leaves per seedling, stem girth, length of tap root, number of secondary roots per seedling, canopy spread, leaf area per seedling, SCMR, leaf dry weight, root dry weight and total dry weight of plant were recorded in the potting media containing Soil, Sand, Vermicompost @ 1:1:1 v/v, AM, Trichoderma Reesei (TCT-10) @ 5g/bag each per bag. However, maximum number of fibrous roots per plant was recorded in potting media with Soil Pressmud + Vermicompost @ 1:1:1 v/v + AM [5g] for Rangpur lime rootstock seedlings. Whereas maximum number of fibrous roots was noticed in the potting media with a combination Soil, Sand, Vermicompost @ 1:1:1 v/v, AM, Trichoderma Reesei (TCT-10) @ 5g/bag each per bag. Minimum growth parameters were recorded when soil, sand, FYM @ 1:1:1 v/v was used as potting media for both rootstocks.

Among different growth regulators tested, to enhance the growth of Rangpur lime and Australian sour orange rootstock seedlings spraying with GA3 @ 200 ppm recorded maximum plant height and SCMR values. Whereas, highest number of leaves per seedling, stem girth, canopy spread, leaf area per seedling, leaf dry weight per plant and total dry weight of plant were recorded when plants are sprayed with IAA @ 150 ppm. Maximum root growth parameters were recorded in the IBA root dipping treatments. Longest length of tap root and number of fibrous roots were recorded when IBA @ 250 ppm was sprayed followed by spraying IAA @ 150 ppm. Number of secondary roots and root dry weight per seedling were found highest with IBA @ 750 ppm followed by IAA 150 ppm. Lowest values per these parameters have been recorded in control for both the rootstocks.

It can be concluded by the present study that from the results recorded in the present study, it can be concluded that the potting mixture containing Soil + Sand + Vermicompost @ 1:1:1 v/v + AM [5g] and Trichoderma Reesei (TCT-10) @ 5g/bag was best potting media for both Rangpur lime and Australian sour orange seedlings grown in the poly bags. All the growth parameters studied except root parameters were maximum with IAA sprays. Root parameters were highest with IBA dipping in both the root stocks.
Highest net monitory returns obtained from the treatment Soil + Sand + Vermicompost @ 1:1:1 v/v + AM [5g] and Trichoderma reesei (TCT-10) @ 5g/bag with higher benefit ratio in potting media experiment in both rootstocks. In growth hormonal experiment highest net monitory retunes was observed in the treatment IBA @ 750 ppm.


ABSTRACT

The present investigation entitled “Effect of dates of sowing and cultivars on growth, yield and quality of beetroot (Beta vulgaris L.)” was carried out during Rabi, 2014-2015 at Horticultural College and Research Institute, Venkataramannagudem, West Godavari District of Andhra Pradesh. The study was carried out with five different sowing dates viz., 1st August, 1st September, 1st October, 1st November and 1st December and three cultivars namely Action, Crimson Globe and Detroit Dark Red. The experiment was laid out in a factorial randomized block design (FRBD) with three replications and the data on effect of different dates of sowing and different cultivars on growth, yield and yield attributes and quality parameters were recorded and statistically analyzed.

Sowing time had shown significant effect on the growth parameters like germination percentage, plant height, plant spread, leaf area, leaf area index and number of leaves. Highest germination percentage, plant height and maximum plant spread, leaf area, leaf area index and number of leaves were produced by plants which were sown on 1st October. Similarly, various yield attributes viz., root length, root girth, fresh root weight, dry root weight, root shoot ratio, root yield per plot and root yield per hectare were highest in 1st October sowing. Among the different dates of sowings, 1st October sowing gave the highest yield of 297.80 q ha⁻¹, whereas lowest yield of 144.5q ha⁻¹ was recorded on 1st August sowing. TSS, reducing and non reducing sugars and ascorbic acid content were also significantly affected by sowing dates. Sowing beetroot at 1st October recorded the highest values of each of the above mentioned parameters. All the parameters viz., growth, yield and yield attributes and quality parameters showed increasing trend upt0 1st October and showed a declining trend thereafter.

Results also revealed that all the growth parameters, yield and yield attributes and quality parameters were also significantly affected by different cultivars. Growth parameters such as germination percentage, plant height, plant spread, leaf area, leaf area index and number of leaves were maximum with Detroit Dark Red cultivar irrespective of dates of sowing. Similarly, the root yield and yield contributing characters were also found to be maximum with Detroit Dark Red cultivar. Highest yield (269.4 q ha⁻¹) was obtained in the Detroit Dark Red cultivar, followed by Action (211.7 q ha⁻¹) and the lowest (187.00 q ha⁻¹) was in Crimson Globe. However, Crimson Globe was found to be the best in respect of quality judged.

In the same concern, the interaction between sowing dates and cultivars also showed significant effect in case of germination percentage, plant height, plant spread, leaf area, leaf area index and yield attributes, yield, reducing and non reducing sugars and ascorbic acid content. Irrespective of cultivars, 1st October sowing was found to be good with respect to growth, yield and yield components. However, among all the treatamental combinations Detroit Dark Red cultivar sown on 1st October recorded the best in respect of yield and yield components, whereas Crimson Globe was found to be the best with respect to quality judged which was sown on the same date i.e., 1st October.
Interaction between the two factors under investigation did not show any effect on the growth parameters *viz.*, number of days to germination, number of leaves, root shoot ratio and quality attributes *viz.*, TSS and shelf life.


**ABSTRACT**

The present investigation entitled “Influence of explant (sucker) age and source of collection (plant crop and ratoon crop) on crop duration and productivity of tissue culture banana cv. Grand Naine (AAA)” was conducted at Horticulture Research Station, Kovvur, West Godavari during 2014-15. The main objective of the investigation is to study the influence of age of explant collected from both main and ratoon crop suckers on productivity and crop duration of tissue culture banana. In field experiment, twelve treatment combinations in which P1 and P2 (Factor 1) are main crop and ratoon crop suckers respectively. Whereas, A1 to A6 (Factor 2) are age of the suckers from one month old explant to six months old explant collected from both main crop and ratoon crops and the same were subjected to tissue culture multiplication up to six cycles. Sixty days hardened plants were planted and evaluated for growth and yield potential under field conditions. The experimental design adopted is Factorial RBD.

With regards to the plant height, pseudostem girth and total number of suckers per plant, no significant differences were observed at shooting stage among the plants obtained from different aged explants (A1 to A6), source of sucker collection (P1 and P2) and their interaction levels (P×A). Whereas, the total number of leaves production was the highest in plants obtained from three months old (A3) explant at shooting stage. Among source of sucker collection, plants from main crop (P1) suckers recorded higher total number of leaves at shooting stage as compared to ratoon crop (P2) sucker plants. Leaf area and leaf area index were significantly highest in plants obtained from three months old (A3) explant among different aged explants. Plants obtained from main crop (P1) sucker also recorded higher values for leaf area and leaf area index at shooting stage. Among the plants obtained from different aged explants, early shooting was observed in plants from five months old (A5) explant. Similarly, the early shooting was observed in plants obtained from ratoon crop (P2) suckers compared to main crop (P1) suckers and similar trend was observed in days taken to harvest. The growth rate for plant height was significantly maximum at 5-7 MAP stage of crop growth in plants obtained from four months old (A4) explant.

Regarding yield attributes, the highest bunch weight and yield was recorded in plants obtained from three months old (A3) explant. Similar trend was observed in case of the number of fruits per bunch, hands bunch-1 and number of fingers per hand. However, it was followed by two months old (A2) explant plants. Among source of sucker collection, plants from main crop (P1) sucker recorded maximum values for bunch weight, number of fruits per bunch, hands bunch-1 and number of fingers per hand. Whereas, finger length and finger girth were found to be non significant for the plants obtained from both the factors and also similar trend was followed with respect to quality parameters.
Results obtained from the present investigation among plants obtained from different aged explants (sucker) in tissue culture, plants from three months old (A3) explant recorded highest yield followed by two months old (A2) explant. Among source of sucker collection, plants from main crop (P1) sucker recorded highest yield as compared to ratoon crop (P2) sucker plants. The same treatment also recorded higher of highest bunch weight, more hands bunch-1, number of fingers per hand and total number of fruits bunch-1.

In view of yield potential in banana cv. Grand naine three months old (A3) explant and two months old (A2) explant can be recommended for production of tissue culture plants in banana cv. Grand naine. Similarly, the treatment combination (P1A3) plants obtained from three months old explant collected from main crop recorded highest yield of 61.75 t/ha with highest B:C ratio 2.88.


ABSTRACT

The study on “Physico-chemical characters, sensory quality and storage behaviour of certain unfermented beverages from jamun based blends” was conducted during the year 2014-15 at HCRI, Venkataramannagudem. The juices used in the study were those obtained from mango, grapes and pineapple blended in different proportions with jamun juice. These juice blends were utilized for evaluation of their quality throughout the acceptable period of storage. Similarly RTS and squashes prepared from such juice blends were also evaluated. Blending improved overall acceptability of juices, RTS and squashes since the physico-chemical and sensory parameters showed desirable values in different blends as compared to pure jamun juice.

Among the physical characters, colour showed significant differences in all the products studied i.e. juice blends, RTS beverages and squashes. Pure jamun juice along with its blends of grape juice showed cyanic colours whereas, xanthic colours were observed in juice blends with mango and foliar colours in the juice blends with pineapple. The colour did not show any change during its 15 days of storage in case of juices and the same result was observed in squashes up to 4 months of storage in various blends. But there was significant change in colour in RTS beverages after 60 days of storage.

The maximum pH was recorded by the products prepared from 25% jamun juice blended with 75% mango and also in 25% jamun juice blended with 75% grape juice. Maximum density was noticed in the unfermented beverages prepared from 25% jamun juice blended with 75% mango.

The quality parameters like total sugars, ascorbic acid content, TSS/acid ratio, total phenols and anthocyanin content were also found to vary significantly. The highest total sugars were recorded in the products prepared from 25% jamun juice blended with 75% mango juice but the reducing sugars were more in the products prepared from 25% jamun juice blended with 75% grape juice. The TSS/Acid ratio was the maximum in the juice and squashes prepared from 25% jamun juice blended with 75% mango. However, in RTS beverages the highest was noticed in the RTS prepared from 25% jamun juice blended with 75% mango juice.
The ascorbic acid, total phenols and anthocyanins were noticed highest in the products prepared from pure jamun juice which was followed by the unfermented beverages prepared from 75% jamun juice blended with 25% grape juice.

Sensory evaluation revealed that there were significant differences with respect to the colour score, taste, flavour and overall acceptability among the various treatments for juice blends, RTS beverages and squashes. The highest colour score was obtained by the products prepared from 100% jamun juice. The maximum score for taste was recorded by the RTS prepared from 75% jamun juice + 25% grape juice. It was on par with 50% jamun juice + 50% grape juice and 75% jamun juice + 25% pineapple juice. The highest score for flavour was obtained by 75% jamun juice + 25 grape juice (T6) which was on par with 25% jamun juice + 75% grape juice. The maximum overall acceptability was obtained by the products from blending 75% jamun juice + 25% grape juice.
1) “Effect of chemicals and plant growth regulators on dormancy, flowering, corm production and vase life in gladiolus (Gladiolus grandiflorus L.)” T. Padma latha.

ABSTRACT

The present investigations entitled “Effect of chemicals and plant growth regulators on dormancy, flowering, corm production and vase life in gladiolus (Gladiolus grandiflorus L.)” were carried out for two years during 2008-09 and 2009-10 at Herbal Garden, Rajendranagar, Hyderabad. For this study, four experiments were conducted with the gladiolus cultivars Darshan and Dhiraj.

In effect of growth regulating chemicals and plant growth regulators on dormancy, flowering and corm and cormel production experiment, cv. Darshan recorded significantly minimum number of days to sprouting and maximum percentage of sprouting over cv. Dhiraj. Pre-planting soaking of corms for 24 h was significantly more influencing over 12 h soaking in decreasing the number of days to sprouting and increasing corm sprouting percentage and number of buds sprouted per corm. Thiourea (TU) 2% and salicylic acid (SA) 150 ppm were highly effective in reducing the number of days taken for sprouting over control. TU 2%, SA 150 ppm, KNO$_3$ 1.5% and GA$_3$ 150 ppm significantly increased sprouting percentage of corms over control and recorded maximum number of sprouts per corm.

The cv. Darshan was early in flowering and performed better than the cv. Dhiraj with respect to vegetative and floral parameters. Likewise, pre-planting soaking of corms for 24 h improved vegetative and flowering attributes. SA 150 ppm followed by TU 2% were more effective in increasing vegetative growth and reducing number of days to flowering. SA 150 ppm followed by GA$_3$ 150 ppm were effective in improving flowering performance of gladiolus cultivars in terms of increasing number of spikes per plant, spike length and weight and number of florets per spike.

The cv. Dhiraj recorded maximum corm size and weight, maximum number of small cormels and total number of cormels per plant over cv. Darshan. Cv. Darshan recorded higher number of big cormels. Soaking of corms for 24 h significantly improved corm and cormel attributes. SA 150 ppm and TU 2% were effective in increasing number of corms per plant. Maximum corm size and weight were recorded with SA 150 ppm and GA$_3$ 150 ppm. Maximum number of big cormels per plant and cormel weight was recorded with TU 2%, GA$_3$ 150 ppm and SA 150 ppm. Control recorded significantly more number of small cormels and total number of cormels per plant.

With respect to studies on the influence of plant growth regulator sprays on flowering and corm and cormel production, cv. Darshan differed significantly with cv. Dhiraj in respect to plant height, leaf area and flowered earlier. GA$_3$ 150 ppm followed by brassinosteroid (BR) 10 ppm recorded maximum plant height, number of leaves and leaf area during vegetative growth and resulted in earlier flowering. TIBA 100 ppm, TIBA 50 ppm and control recorded significantly minimum leaf area and showed delayed flowering. Cv. Dhiraj recorded maximum percentage of plants flowered than the cv. Darshan. Cv. Darshan recorded significantly highest spike length and inter floret length and minimum days to wilting of spike over the cv. Dhiraj. Cv. Dhiraj was significantly superior over cv. Darshan in respect of number of florets per spike and longevity of spike. Maximum spike length and weight, number of florets per spike and
spike field life were recorded with GA$_3$ 150 ppm. Lowest values in respect of flower parameters were recorded with TIBA treatments and control.

The cv. Darshan recorded maximum number of big cormels per plant and cormel weight. Cv. Dhiraj recorded maximum number of small cormels per plant. Foliar sprays of BR 10 ppm and GA$_3$ 150 ppm significantly increased number of corms produced per plant, corm size and corm weight and propagation coefficient. Number of big cormels per plant and total number of cormels were recorded significantly higher with BR 10 ppm and was followed by TIBA 100 ppm. BR 10 ppm and TIBA 100 ppm produced maximum number of small cormels per plant. Weight of cormels per plant was recorded maximum with BR 10 ppm and GA$_3$ 150 ppm.

In studies on effect of chemicals and plant growth regulators on induction of flowering in gladiolus plants raised from cormels, cv. Darshan was significantly superior over cv. Dhiraj in respect of vegetative parameters and earliness in flowering. Foliar sprays of SA 150 ppm and Ca(NO$_3$)$_2$ 1% recorded maximum vegetative growth and were significantly effective in induction of early flowering in the plants raised from cormels. These treatments also recorded significantly highest flowering percentage. Control and TIBA 100 ppm took maximum number of days to flowering. Number of spikes per plant, spike length and weight, number of florets per spike and spike longevity were maximum with salicylic acid at 150 ppm. Cv. Dhiraj recorded maximum corm size and number of small cormels per plant. BA 100 ppm and SA 150 ppm recorded maximum number of corms per plant, corm size, corm weight, number of big and small cormels per plant, total number of cormels per plant and weight of cormels per plant.

In the post harvest experiments, pre-planting soaking of corms for 24 h recorded significantly less number of days to first floret opening. Pre-planting treatment of corms with SA 150 ppm recorded minimum days to first floret opening, maximum number of florets opened at a time per spike and vase life.

The cv. Darshan recorded maximum diameter of the second fully opened floret and higher vase life than cv. Dhiraj due to pre-harvest foliar sprays of plant growth regulators. Pre harvest foliar sprays of GA$_3$ 150 ppm, BR 10 ppm and CPPU 5 ppm induced earliest first floret opening and recorded maximum values for number of florets opened at a time per spike, diameter of second full opened floret and vase life.

The cv. Darshan recorded maximum diameter of the second fully opened floret and higher vase life than cv. Dhiraj due to pre-harvest foliar sprays of plant growth regulators and chemicals on the plants raised from cormels. Significantly minimum days to first floret opening, maximum number of florets opened at a time per spike and diameter of second floret were recorded with pre harvest foliar sprays of SA 150 ppm, BA 100 ppm and Ca(NO$_3$)$_2$ 1%. Maximum vase life of 7.17 days was recorded with SA 150 ppm.


ABSTRACT

Mango is a climacteric fruit generally harvested green, which ripens during the marketing process (transport and storage) with an irregular storage and short shelf life period between harvest and consumption. To evaluate different maturity stages of harvest, post
harvest 1-MCP chemical treatment and packing material most suitable for enhancing the shelf life of commercial popular Baneshan mango fruits for along distance shipment this experiment was conducted.

The present investigation was executed by formulating four experiments, two experiments were carried out in the year 2009-10 and the best treatments from these experiments were taken and another two experiments were carried out in the year 2010-11 on mango cv. Baneshan fruits harvested at two different maturity stages (7-8 TSS, M1 and 8-9 TSS, m2) stored at 12.5°C + _ 1.

In the experiment “Effect of post harvest chemical treatments and storage intervals at low temperature (12.5°C) on shelf life of mango cv. Baneshan at two stages of maturity” the O2 (%) and CO2(%) in Extend bags was maintained constitutively throughout the storage period without moisture accumulation, where as the O2 level in polypropylene bags was not consistent. Firmness and colour development was better in extend bag stored frits at ambient conditions. After 14 days and 28 days of cold storage Xtend bag stored frits has more pH. Qualithy parameters like TSS, Acidity, Reducing sugars and Total sugars of Baneshan mango were better in Xtend bags. Xtend bags stored fruits had better Tss after 14 and 28 days of cold storage at ambient conditions. All the physico – chemical parameters were better in M2.

In the Third experiment “Effect of post harvest chemical treatments and storage intervals at low temperature (12.5°C) on shelf life of mango cv. Baneshan at two stages of maturity” the O2 (%) and CO2(%) levels were consistent mango cv. Baneshan frits packed in the Xtend bags. Though the firmness was more in 1-MCP + polypropylene bags after 14days and 28 days of cold storage and at ambient conditions the process of ripening and colour change were not uniform, where as the fruits in 1- MCP+ X tend bags had acceptable firmness during the storage period. pH, TSS and Titrable acidity, Ascorbic acid and Total sugars were influenced only after 28 days of cold storage, were better in 1- MCP + Xtend bags treatments at ambient conditions. Beta Carotene in peel and pulp was better 1 - -CP+X tend bags had acceptable firmness during the storage period. pH, TSS and Titrable acidity, Ascorbic acid and Total sugars were influenced only after 28 days of cold storage, were better in 1 – MCP + Xtend bags treatments at ambient conditions. Maturity stages had no influence on firmness immediately after removal from cold strogae that is on ‘O’ day. Maturity sstage M2 had better colour development . TSS was better in maturity stage M2 and Ascorbic acid was less in m2 when compared to m1 maturity stage. Beta carotne in peel and pulp was more m2.

In the fourth experiment “Effect of 1-MCP treatment and combination of 1- MCP and Xtend bags on shelf life of mango cv., Baneshan at two stages of maturityu stored for 28 days. 32 days and 36 days, 40 days and 44 days at 12.5 C + 1” the spoilage per cent increased in 1 – MCP + xtend bags and this may be due to accumulation of moisture in the bags after 28 days. Though the natural ripening of mango fruits exposed to 1 – MCP and held in Xtend bags was delayed, the results indicated that there was moisture accumulation in the bags after 28 days.
Extended holding of 1 – MCP treated fruit in xtend bags encouraged physiological and pathological deterioration.

In conclusion, 1 – MCP application in combination with MAP can be used effectively to reduce the respiration rates and fruit softending during cold storage and to Xtend the storage and life up to 28 days by 4 days of ripening at ambient conditions without any adverse effects on the quality of ripe fruit. Overall 1-MCP 1000 ppb on 8-9 TSS maturity stage (m2) was effective in extension of shelf life of Baneshan mangoes up to 28 days at 12.50°C + four days at ambient temperature.


ABSTRACT

An investigation was carried out to evaluate genetic diversity in eighty four accessions of brinjal with morphological and molecular markers. Eleven RAPD and twenty two SSR markers were employed to analyse the molecular genetic diversity and to establish phylogenetic relationships among the accessions.

The 26 quantitative and 25 qualitative morphological characters were evaluated. Analysis of variance on twenty six quantitative traits revealed significant differences among eighty four accessions for almost all the characters studied thus indicating wide variation among the accessions. The high values of PCV and GCV observed for leaf, flower and fruit characters and yield per plant indicated that the variability observed among the brinjal accessions was high.

High heritability coupled with high genetic advance was recorded for leaf blade length, leaf blade width, leaf petiole length, days to 50% flowering, number of flowers per cluster, relative style length, days to first fruit set, per cent fruit set, days to harvest, number of fruits per cluster, number of fruits per plant, fruit length, fruit breadth, fruit pedicel length, fruit pedicel thickness, fruit weight, fruit volume, seed weight, seed diameter and yield per plant which revealed the involvement of additive gene action.

The number of flowers and fruits per cluster, fruit length and number of fruits per plant were positively associated with fruit yield and among themselves and were identified as major yield components emphasizing the significance of direct selection of these components for genetic improvement of yield. Path coefficient analysis also revealed that fruit set percentage, fruit weight, number of fruits per plant, relative style length and number of flowers and fruits per cluster had high direct effect and positive correlation values with per plant yield. Hence, these characters may be selected in yield improvement programme.

Multivariate analysis following Mahalanobis $D^2$ statistic grouped the entire germplasm into ten distinct clusters. The inter cluster distance was maximum between cluster III and IX (136.52) indicating that the accessions of these clusters are highly divergent. Yield per plant and seed weight had maximum contribution to total divergence
and crosses between the accessions of these clusters (cluster III and IX) may be effective and result in high heterosis.

The RAPD analysis with 11 primers produced 100 per cent polymorphism with an average of 4.5 polymorphic bands per primer and detected a moderate level of genetic variation among brinjal accessions with average similarity coefficient of 0.36. Accession-specific RAPD markers were detected only for two accessions such as IC112726 (OPP 17) and IC336793 (OPB 20). The UPGMA analysis grouped the accessions into two main clusters viz., cluster I (forty four accessions) and cluster II (forty accessions).

In total, thirty alleles were detected using twenty two SSR primer pairs and Polymorphic Information Content (PIC) values ranged from 0.1491 (155) to 0.5293 (117). UPGMA analysis grouped the accessions into two main clusters viz., cluster I (eighty two accessions) and cluster II (two accessions). Among the commercial check varieties, Bhagyamati, Shyamala and Gulabi were included in one cluster while Arka Keshav was included in another cluster. The exotic collections viz., EC386589, EC316280, EC384565, EC385380, EC329327 and EC316226 were included separately in different clusters along with other indigenous collections. The genetic diversity observed by SSR and RAPD markers indicated presence of considerable variation among the germplasm lines.

The SSRs were able to differentiate exotic collections and commercially grown check varieties into different groups to some extent, indicating that SSRs is a more accurate and reliable method than RAPD to study the genetic diversity in brinjal.


ABSTRACT

The present investigation entitled, “Studies on the effect of maturity stages and post harvest treatments on the storage behaviour of guava fruits (Psidium guajava L.) cv. Lucknow-49 at low temperature” was carried out during 2009-10 and 2010-11 at Post Harvest Laboratory, College of Horticulture, Rajendranagar, Hyderabad. A set of five experiments were conducted using mature green (MG) and colour turning (CT) stages of guava fruits with post harvest application of calcium compounds, growth regulators, polyamines and LDPE packaging to study the physico-chemical, physiological and biochemical changes during storage at low temperature (10±1°C and 90±5% RH) and subsequent post-low temperature storage (22±4°C and 60±5% RH).

Irrespective of maturity stages and post harvest treatments used, weight loss, skin colour (Hunter ‘L’, ‘a’ and ‘b’), ripening and spoilage of guava fruits increased progressively, whereas fruit firmness decreased consistently during storage. However, TSS, reducing and total sugars increased gradually and reached their peaks on days coinciding with ripe stage followed by a gradual decline towards the end of storage. Pectin, acidity and ascorbic acid contents also decreased with the advancement of storage period. Organoleptic parameters such as, fruit appearance and colour, flavour, taste and overall acceptance gradually increased till ripe stage, while fruit texture declined continuously. Activity of cell wall degrading enzyme, PME declined gradually till the fruits became ripe, but increased in the over-ripe stage. Likewise, respiration and ethylene production rates also exhibited similar pattern of increase coinciding
with ripe stage followed by a decline later. However, the peak in respiration rate was preceded by maximum ethylene production in guava during storage at 10±1°C.

In studies on the effect of maturity stages and calcium compounds on storage behavior of guava, mature green stage fruits exhibited longer storage life and better fruit quality with all the treatments compared to colour turning stage during storage at 10±1°C. Among the calcium treatments, Ca(NO₃)₂ -2% recorded highest storage life with reduced losses in weight, firmness, spoilage and skin greenness (negative Hunter ‘a’). Fruit ripening and yellow colour development (Hunter ‘L’ and ‘b’) were also delayed. All the quality and organoleptic parameters were found to be better with the treatment Ca(NO₃)₂ -2%. There were also considerable reductions in the rate of respiration, ethylene production and activity of cell wall degrading enzyme (PME) with the post harvest application of Ca(NO₃)₂ -2%.

With respect to studies on the influence of maturity stages and growth regulators on the storage behavior of guava, mature green stage fruits exhibited longer storage life and better fruit quality with all the treatments compared to colour turning stage during storage at 10±1°C. Post harvest application of GA₃ -300ppm exhibited better retention of green colour (negative Hunter ‘a’) and acidity of guava fruits. It also retarded the rate of ripening and yellow colour development (Hunter ‘L’ and ‘b’) with concomitant reduction in ethylene production. However, maximum storage life and organoleptic quality was observed with BA -50ppm. The treatment BA -50ppm effectively maintained higher firmness, reduced weight loss and spoilage percentage of guava fruits with highest TSS, sugars, ascorbic acid and pectin contents during storage, besides lowering the rate of respiration and PME activity.

In studies on the effect of maturity stages and polyamines on the storage behavior of guava, mature green stage fruits exhibited longer storage life and better fruit quality with all the treatments compared to colour turning stage during storage at 10±1°C. The treatment SPM -200ppm was found superior in maintaining higher firmness, skin greenness (negative Hunter ‘a’), acidity, pectin content and texture of guava fruits during storage. It was also proved effective in retarding the rate of ripening and yellow colour development (Hunter ‘L’ and ‘b’). There was a prominent reduction in ethylene production and PME activity with post harvest application of SPM -200ppm. However, storage life, quality and organoleptic parameters were found to be better with the post harvest application SPM -100ppm. SPM -100ppm effectively reduced weight loss, spoilage loss and rate of respiration during storage.

In the fourth experiment, the best post harvest treatments from 1st, 2nd and 3rd experiments viz., Ca(NO₃)₂ -2%, BA -50ppm and SPM -100ppm were combined with six packaging treatments (LDPE 100 and 200 gauge with 1%, 2% and without ventilation) to study the storage behavior of mature green (MG) guava fruits at low temperature. Losses in weight, firmness, skin greenness (negative Hunter ‘a’), yellow colour development (Hunter ‘L’ and ‘b’), ripening and spoilage of fruits were significantly reduced with post harvest application of SPM -100ppm packed in 200 gauge LDPE bags without ventilation. The treatment SPM -100ppm in combination with 200 gauge LDPE without ventilation also recorded highest storage life, fruit texture, acidity and ascorbic acid contents of fruits during storage at 10±1°C. The quality (TSS and sugars) and organoleptic (fruit flavour and taste) parameters were found to be superior in guava fruits treated with either Ca(NO₃)₂ -2% or BA -50ppm packed in 200 gauge LDPE bag with 1 percent ventilation during storage at 10±1°C. However, fruit appearance and colour, and overall acceptance were better in SPM -100ppm in combination with 200 gauge LDPE with 1 percent ventilation.
Among the post-low temperature storage (PLTS) experiments, MG guava fruits taken on 5th, 10th, 15th and 20th days of low temperature storage recorded a maximum shelf life of 8, 6, 6 and 4 days respectively at ambient conditions (22±4°C and 60±5% RH). However, MG guava fruits treated with either Ca(NO₃)₂ -2% or BA -50ppm, removed from 200 gauge LDPE bags with 1 percent ventilation taken on 10th day of low temperature storage could retain highly acceptable organoleptic quality upto 6 days at 22±4°C. Also, MG guava fruits treated with either SPM -100ppm, removed from 200 gauge LDPE bags with 1 percent ventilation taken on 15th day of low temperature storage could retain better acceptable organoleptic quality upto 6 days at 22±4°C. Similarly, MG guava fruits treated with either SPM -100ppm, removed from 200 gauge LDPE bags without ventilation taken on 20th day of low temperature storage could retain good acceptable organoleptic quality upto 4 days at 22±4°C.


ABSTRACT

The present investigation on “Heterosis, Combining ability and Gene action studies in Bitter gourd (Momordica charantia L)” has been undertaken at Model orchard, College of Horticulture, Rajendranagar, Hyderabad during summer 2009 to summer 2011 to estimate heterosis, heterobeltiosis, standard heterosis and inbreeding depression and to understand the nature of gene action through combining ability as well as generation mean analysis for adopting appropriate breeding strategy. In this direction, eight divergent parents were crossed in diallel mating design (without reciprocals) to generate twenty eight hybrids and evaluated along with parents including standard check to know the combining ability of parents and crosses. Since combining ability analysis does not provide comprehensive information on gene action involved in inheritance of characters, the generation mean analysis was done in four crosses for earliness and yield.

The estimates of heterosis, heterobeltiosis and standard heterosis were variable among the crosses in the present study. Heterosis over mid-parent in desired direction was recorded for yield and yield attributing traits viz., vine length (41.34%), number of laterals/vine (21.21%), internodal length (-23.28%), days to 1st male flower (-9.33%), days to 1st female flower (-9.57%), Node number at 1st male flower appeared (-27.15%), node number at 1st female flower appeared (-20.34%), sex ratio (-21.93 %), average fruit weight (51.41%), fruit length (40.0%), number of fruits/vine (37.55%), average fruit weight (51.41%), fruit length (40.0%), fruit girth (24.36%), pulp thickness (26.34%), number of seeds/ fruit (-20.49%) and yield/vine (96.03%).

The combining ability analysis revealed the importance of both additive and non-additive gene action in governing the characters but non-additive gene action was found predominant. Non-additive gene action primarily governed yield/vine and other yield attributing traits like number of laterals/vine, internodal length, node number at 1st male flower, node number at 1st female flower, sex ratio, average fruit weight, fruit length, fruit girth, and number of seeds/fruit. Additive gene action was important for vine length; days to 1st male flower appeared; days to 1st female flower appeared, number of fruits/vine and pulp thickness.

In the present investigation, among the parents, IC-044438, IC-470560, IC-470558 and IC-085622 showed high mean performance as well as high GCA effects for one or more traits hence, considered to be superior general combiners for utilization in hybridization programme for the crop improvement in bitter gourd. Among the crosses, IC 044438 × IC
045339 followed by IC-044417 × IC-470558 were found to be highly promising hybrids by expressing heterosis in all forms (relative heterosis, heterobeltiosis and standard heterosis) and SCA effects in desirable direction for yield and most of the yield contributing characters. For earliness, the crosses, IC-044438 × IC-045339, IC-045339 × IC-470550 and IC-045339 × IC-470558 were identified as promising specific crosses.

The generation mean analysis revealed the presence of non-allelic interactions for earliness and yield in all four crosses except IC-470550 × IC-470558 for vine length where selection would be recommended due to governance of additive gene effect in its inheritance. In other cases, since, dominance and epistatic interactions played a major role in inheritance of yield and its component characters specific breeding strategies have to be adopted for improvement of a particular trait. Pedigree method of selection, reciprocal recurrent selection or diallel selective mating system may be an effective approach for attaining higher yields with desirable properties in bitter gourd.

The traits like number of fruits/vine, average fruit weight, fruit length and yield/vine had high heritability and high genetic advance as per cent of mean in addition to high correlation with yield and direct effect on yield have to be considered in future selection programme.

Based on overall results, heterosis breeding for the crosses viz., IC-044438 × IC-045339 (vine length, fruit weight, fruit length, pulp thickness and yield) and IC-045339 × IC-085622 (number of fruits/vine, fruit weight, fruit girth and yield) while pedigree method of selection and recurrent selection for the crosses like IC-044438 × IC-470560 (days to 1st male flower appeared), IC-044438 × IC-045339 (number of fruits/vine), IC-044417 × IC-470558 and IC-044417 × IC-085622 (fruit length) and IC-044438 × IC-045339 and IC-045339 × IC-470558 (yield/vine) can be successfully employed for attaining higher yields with desirable properties in bitter gourd.

6. “Assessment of genetic diversity in Chrysanthemum (Dendranthema grandiflora Tzvelec) cultivars based on phenotypic and molecular markers.”- P. Lalitha Kameswari.

ABSTRACT

The present investigation was carried out to evaluate genetic diversity in chrysanthemum genotypes maintained at Floricultural Research Station, ARI, Rajendranagar, Hyderabad using morphological and molecular (RAPD and ISSRs) markers. The 30 quantitative and 23 qualitative morphological characters on plant, leaf and flower characters were evaluated. In molecular diversity studies, 27 RAPD primers and 10 ISSR primers were employed to establish phylogenetic relationships among the genotypes.

Analysis of variance revealed highly significant differences among the 104 genotypes of chrysanthemum for all the thirty quantitative traits, thus indicating wide variation among the genotypes. The chrysanthemum genotypes Pink Cascade, Beauty, Cloverlee Star and Yellow Gold were found to be the early flowering varieties. The genotypes Star Pink, Rose day and Jessie Hab Good exhibited maximum flower size. The high multiplication rate was observed in the genotypes Yellow Bonsai, PAU-B-107, Local Button, Chandrika and Aparajitha by producing more number of suckers per plant. The genotypes Local Button, Chandrika, PAU-B-107 and Rekha were adjudged as superior over other genotypes in terms of flower yield per plant.
Higher estimates for GCV and PCV were observed for all the characters studied except for plant height, days to flowering, spray length and duration of flowering showing ample scope for selection of those characters. High heritability coupled with high genetic advance as percentage of mean was recorded for all the quantitative characters studied except for duration of flowering indicating contribution of additive gene effects in the expression of these traits. A significant positive correlation both at genotypic and phenotypic levels was recorded between flower yield and plant attributes viz., plant spread at both the directions, number of primary branches per plant, spray length and number of flowers per spray. Path coefficient analysis revealed that plant spread in N-S direction recorded the highest direct effect on flower yield per plant followed by number of flowers per spray, days to 50% flowering, number of primary branches per plant, average flower weight and duration of flowering.

Based on Mahalanobis $D^2$ analysis, the chrysanthemum genotypes were grouped into eleven divergent clusters. The highest inter cluster $D^2$ value was recorded between clusters VI and IX (195.87) indicating that crosses may be attempted between the genotypes of cluster VI (Apurva Singar and Local Button) and cluster IX (Miss India, Tambra, White Silver Cloud, Red Queen and Swan) to obtain new desirable recombinants in chrysanthemum. Among all the characters, the most important character contributing to divergence was number of ray florets per head followed by number of disc florets per head and flower yield per plant. With principal component analysis, the first eight principal components with eigen values more than one contributed to 73.23 per cent of cumulative variability.

RAPD analysis with 27 primers detected high diversity among the 37 chrysanthemum genotypes. A total of 278 amplified fragments were scored out of which 271 were found to be polymorphic (97.4%). Genotype-specific RAPD markers were detected only for few genotypes Meera(OPE-14), Salora(OPF-5), Terry(OPF-19), Punjab Anuradha(OPG-16), Anjali(OPG-19) and Asha(OPM-10) which could be exploited for DNA fingerprinting of these genotypes. The genetic similarity ranged from a coefficient of 0.174 to 0.600 with an average similarity coefficient of 0.387 indicating a high diversity among the group of genotypes studied. In the present study, Ratlam Selection and Snow Cem were found to be most genetically similar (0.60) followed by Akitha and Shintome with 55.3%. Cluster analysis led to the classification of genotypes into four major cluster and seven minor clusters with one genotype each in cluster V(Arka Ravi), VI(Meera), VII(Asha), VIII(Silper), IX(Autumn Joy), X (Lilith) and cluster XI (Chandrika).

With ten ISSR primers, 114 bands were amplified, of which 107 bands were polymorphic, accounting for 93.86% polymorphism. The similarity coefficient values ranged from 0.275 to 0.775 with a mean similarity matrix of 0.525. Among the 37 genotypes studied, the closest relationship was scored between Geetanjali and Red Stone with similarity level of 77.5%. The UPGMA dendrogram revealed that the chrysanthemum genotypes were grouped into ten clusters.

Both morphological and molecular characterization methods were found efficient in grouping the genotypes. Among these methods, molecular analysis grouped more accurately than morphological diversity. Among the two marker systems employed, 27 RAPD primers revealed 97.4% of polymorphism while 10 ISSR primers showed polymorphism of 93.86% among 37 genotypes. As per the clustering pattern of morphological, RAPDs and ISSRs, the genotypes Snow Cem and Ratlam Selection; Akitha and Shintome as well were clustered in one group indicating the efficiency of three systems. Identification of markers associated with specific traits of interest, which could be converted into SCAR markers needs attention to
speed up the crop improvement programme. Hybridization among promising genotypes of divergent clusters could yield heterotic effects for flower quality (in terms of colour, shape, size) and flower yield in addition to creation of new gene combinations and thus help in development of new promising cultivars of chrysanthemum.

7. “Studies on different agro – techniques for improving flower yield, quality and storage life of african marigold (Tagetes erecta L.) cv. pusa narang gainda” - M.G. Bala Hussaini.

ABSTRACT

In African marigold Cv. Pusa Narangi Gainda, the maximum plant height was recorded at a wider spacing of 50 cm x 30 cm and without pinching. More number of branches per plant, minimum number of days for first flowering, and 50% flowering, more number of flowers per plant and maximum flower diameter were observed in wider spacing (50 cm x 30 cm) with pinching at 30 DAT. The weight of single flower, flower yield per plant and yield per hectare were found maximum in spacing of 40 cm x 30 cm with pinching at 30 DAT.

The maximum plant height, less number of days for flowering (1st flowering) and 50% flowering, maximum weight of single flower and maximum weight of flowers per plant were observed in the interaction of nitrogen @ 250 kg ha\(^{-1}\) and phosphorus @ 100 kg ha\(^{-1}\) along with ferrous sulphate @ 0.75% (N\(_2\)P\(_2\)F\(_2\)).

Maximum number of flowers per plant was observed in the interaction of nitrogen @ 250 kg ha\(^{-1}\) and phosphorus @ 100 kg ha\(^{-1}\) along with foliar spray of magnesium sulphate 0.75% (N\(_2\)P\(_2\)M\(_2\)).

Maximum number of branches per plant, flower diameter and flower yield per hectare were found with the interaction of nitrogen @ 250 kg ha\(^{-1}\) and phosphorus @ 100 kg ha\(^{-1}\) along with foliar spray of zinc sulphate 1.0% (N\(_2\)P\(_2\)Z\(_2\)).

Maximum plant height, increased number of branches per plant, more number of flowers per plant, maximum flower diameter, single flower weight, weight of flowers per plant and maximum yield per hectare were observed with the treatment NAA @ 300 ppm. Less number of days for flowering (1st flowering) and 50% of plants to reach flowering was found with the treatment of CCC @ 1000 ppm.

Increased flower yield ha\(^{-1}\) and maximum lutein content were found with the composite treatment CT\(_3\) (spacing at 40 cm x 30 cm, pinching at 30 DAT, 250 kg nitrogen ha\(^{-1}\), 100 kg P\(_2\)O\(_5\) ha\(^{-1}\) along with foliar spraying of magnesium sulphate at 0.75% and NAA at 300 ppm).

Highest carotenoid content was recorded with the composite treatment CT\(_4\) (spacing at 40 cm x 30 cm, pinching at 30 DAT, 250 kg nitrogen ha\(^{-1}\), 100 kg P\(_2\)O\(_5\) ha\(^{-1}\) along with foliar spraying of magnesium sulphate at 0.75% and NAA at 200 ppm).
The minimum percent loss of physiological weight of flowers and maximum storage life of flowers were observed with the composite treatment CT3 (spacing at 40 cm x 30 cm, pinching at 30 DAT, 250 kg nitrogen ha\(^{-1}\), 100 kg P\(_2\)O\(_5\) ha\(^{-1}\) along with foliar spraying of magnesium sulphate at 0.75% and NAA at 300 ppm).

8. “Exploitation of heterosis and combining ability for yield, quality and processing in tomato (Solanum lycopersicum L).” – Y. Madhavi.

**ABSTRACT**

The present investigation “Exploitation of heterosis and combining ability for yield, quality and processing in tomato (Solanum lycopersicum L).” was carried out during rabi, 2010-11 and kharif, 2011 at Vegetable Research Station, Rajendranagar, Hyderabad to study the genetic parameters, heterosis, combining ability, gene action governing the inheritance of the traits, correlation coefficient analysis, path coefficient analysis, storage studies at ambient conditions and quality of value added products. Six lines (EC-165749, LE-56, LE-62, LE-64, LE-65 and LE-67) were crossed with three testers (Punjab Chuhara, Pant T-3 and Pusa Gaurav) in line x tester mating design. The resultant 18 F1’s were evaluated along with their parents and three standard checks (Lakshmi, US-618 and Arka Vikas) for twenty characters viz., plant height (cm), number of primary branches per plant, days to 50% flowering, number of flowers per cluster, number of fruits per cluster, fruit length (cm), fruit width (cm), average fruit weight (g), fruit yield per plant (kg), pulp yield (%), peel to pulp ratio, number of locules per fruit, pericarp thickness (mm), TSS (° Brix), titrable acidity (%), ascorbic acid content (mg/100 g), total carotenoid content (mg/100 g), reducing sugars (%), total sugars (%) and lycopene content (mg 100/ g).

The genetic variability studies indicated that genetic material in the present investigation possessed variability which provides sufficient basis for selection by breeder. High estimates of PCV and GCV were obtained for plant height, number of fruits per cluster, average fruit weight, fruit yield per plant, peel to pulp ratio, number of locules per fruit, pericarp thickness, ascorbic acid, reducing sugars and lycopene indicated a good deal of variability in those characters signifying the effectiveness of selection of desirable types for improvement. High heritability assisted with high genetic advance as per cent of mean was observed for plant height, number of primary branches per plant, number of fruits per cluster, fruit length, average fruit weight, fruit yield per plant, peel to pulp ratio, number of locules per fruit, pericarp thickness, titrable acidity, ascorbic acid content, total carotenoid content, reducing sugars, total sugars and lycopene content. Hence, simple selection based on phenotypic performance of these traits would be more effective.

Combining ability analysis revealed that the ratio of gca variance (\(\_\_\_2\) gca) to sca variance (\(\_\_\_2\) sca) is less than unity(<1) indicating the preponderance of non-additive gene action involved in the inheritance of number of primary branches per plant, days to 50% flowering, number of flowers per cluster, number of fruits per cluster, fruit length, fruit width, average fruit weight, fruit yield per plant, pericarp thickness, TSS, ascorbic acid content, total carotenoid content, reducing sugars, total sugars and lycopene content, except plant height, pulp yield, peel to pulp ratio, number of locules per fruit and titrable acidity with the ratio of gca variance to sca variance of more than unity (>1), which are predominated by additive gene action. Since non-additive gene action was predominant for yield, yield contributing traits and quality parameters, it is advocated to undertake hybridization programme among the promising
parents for genetic improvement of these characters in tomato. Parental line LE-56 and tester Punjab Chhuhara were identified as good general combiners for yield and yield components with good fruit quality and are recommended for use in breeding programmes to improve yield and quality in tomato. Of the top three promising specific combiners identified for fruit yield per plant (LE-64 × Pusa Gaurav, LE-62 × Pant T-3 and LE-56 × Pant T-3), the cross LE-56 × Pant T-3 having high \textit{per se} performance, good fruit quality and one of the parents with high \textit{sca} effect, could be utilized in recombination breeding with the selection of superior plants in passing generations to evolve hybrids with higher fruit yield per plant and good fruit quality.

Studies on heterosis revealed that majority of the hybrids exhibited relative heterosis, heterobeltiosis and standard heterosis in desirable direction. The hybrids exhibiting high \textit{per se} performance also showed high standard heterosis. The potential crosses like LE-56 × Pant T-3, LE-56 × Pusa Gaurav, LE-64 × Punjab chhuhara and LE-56 × Punjab chhuhara exhibited high standard heterosis and high \textit{per se} performance for fruit yield per plant, which offers scope for commercial exploitation through heterosis breeding. From correlation studies it was observed that fruit yield per plant has exhibited highly significant positive association with number of primary branches per plant, number of flowers per cluster, number of fruits per cluster, fruit length, fruit width and average fruit weight. Path analysis showed that the characters, number of primary branches per plant, number of flowers per cluster, number of fruits per cluster, fruit width, average fruit weight, pulp yield, pericarp thickness and lycopene at phenotypic level exhibited positive direct effects on fruit yield per plant and these traits also recorded positive correlation with fruit yield per plant. This suggested that direct selection based on these traits will be rewarding for yield improvement.

Among the thirty treatments of tomato under ambient room conditions the hybrids LE-56 × Pusa Gaurav, EC-165749 X Pant T-3, LE-56 × Punjab Chhuhara, LE-64 × Punjab Chhuhara and LE-64 × Pant T-3 had better keeping quality for 16 days. In an evaluation of nine parents, eighteen hybrids and three checks of tomato for quality of ketchup, paste and puree, the parent LE-64 was found to be the best for making ketchup, paste and puree followed by LE-56 and Punjab Chhuhara. The hybrids involving LE-64, LE-56 and Punjab Chhuhara were found to be better for their qualities such as lycopene content, total carotenoid content, ascorbic acid content and sugars. The hybrids LE-56 × Punjab Chhuhara, LE-64 × Punjab Chhuhara, LE- 62 × Punjab Chhuhara and LE-56 × Pusa Gaurav are best suited for processing having moderate acidity and high lycopene content and these hybrids scored maximum for overall acceptability of the products.


\textbf{ABSTRACT}

The present investigation “Studies on genetic diversity, screening and identification of parents and hybrids for drought tolerance in tomato (\textit{Solanum lycopersicum L.})” was carried out during \textit{rabi}, 2011, summer, 2012 and \textit{rabi} 2012-13 at Vegetable Research Station, Rajendranagar, Hyderabad and NBPGR Regional station, Hyderabad. Fifteen lines were crossed with three testers in line x tester mating design and the resultant 45 \textit{F}$_1$‘s along with their parents and three standard checks (Pusa Ruby, Marutham and PKM1) were evaluated for 22 characters \textit{viz.}, root length (cm), stem girth (mm), plant height (cm), number of primary branches, days to 50\% flowering, number of fruit per plant, number of locules per fruit, average fruit weight (g), fruit yield/plant (g), shoot dry weight (g), root dry weight (g), RDW/SDW, SDR (sec/cm), relative water content, leaf area (sq.cm), specific leaf weight...
The genetic diversity among 50 genotypes in tomato showed highly significant differences among the genotypes for all the characters indicating presence of sufficient amount of variability in all the traits. Mahalanobis $D^2$ statistics revealed that considerable genetic diversity within and among nine clusters. The characters viz., fruit weight, number of fruits per plant, root length and plant height were the potent factors in differentiating the germplasm of tomato under this study. Based on genetic divergence and mean performance of eleven genotypes viz., EC165036, EC164665, EC310301, EC164677, EC164654, BSBS 47, IC249511, EC162600, EC251578, NS 537 and NS 526 from I, II, III and IX clusters for fruit yield, eight genotypes viz., IC249503, EC163663, IC 249507, EC23528, IC249514, EC251750, EC497390 and EC164670 from II, III, IV, VI, VIII and IX clusters for earliness, nine genotypes viz., EC164665, IC249511, EC315500, IC249507, EC164667, EC165045, EC257509, EC165038 and EC165700 from I, II, III IV and VII clusters for root length and seven genotypes viz., EC165045, EC241150, EC164665, EC251646, IC249511, EC645165 and EC165952 from I, III and VIII clusters for RDW/SDW were found superior and they can be used for future breeding programmes even under moisture stress conditions.

Genotypic and phenotypic coefficient of variation were high (>20%) for all traits except for days to 50% flowering and days to first fruit set. High heritability (>60%) coupled with high genetic advance as per cent mean (>20%) was observed for all the characters except for number of primary branches per plant, days to 50% flowering, days to first fruit set and fruit yield per plant indicating the additive gene action for these traits.

Screening of 50 tomato genotypes for drought tolerance under PEG-6000 concentrations of 0, 20, 40 and 60 g/l revealed significant differences for all the traits. Genotypes with higher germination percentage, root length and dry weights were selected during screening tomato germplasm for drought tolerance.

Depending on environmental conditions, tomato genotypes have a specific growth and productive potential. In present drought tolerance screening experiments, the 50 genotypes further screened in polyhouse to confirm their performance under stress (control, 10days, and 15 days irrigation interval).

The divergent drought tolerant genotypes possessed the features of moderate leaf area, higher RWC, more pubescence, higher proline and lycopene content, high stomatal diffusive resistance and dry weights. Considering the results of all the three experiments (Genetic diversity, laboratory and field screening), the genotypes viz., EC251578, NS537, EC162516, EC164845, IC249512, EC165952, EC164665, IC249511, EC168096, EC164677, EC162600, EC310301, EC635525, IC249513 and EC241148 were selected based on drought tolerance for breeding experiments and used as one of the parents for future use in breeding for drought tolerance.

The parents differed markedly in their ability to yield under moisture stress conditions. Ranking of parents on the basis of gca effects and per se performances indicated that good general combiners gave either high or average per se performance for majority of the traits. Based on combining ability results, the genotypes EC251578, IC249512, EC162516, EC249503 and EC164654 recorded high positive gca effects. IC249512, EC164845, EC249505 and EC164654 are ideal choice for yield under stressed condition. IC249512 was
good performer for most of the traits in both irrigated and stressed conditions. Besides high yield, IC249512 is a very poor performer for stomatal diffusive resistance, shoot dry weight and proline content under irrigated conditions. Three parents EC162516, EC249505 and EC168096 are identified as good general combiners. They possess yield and yield related genes in drought environment. So, these lines are reliable for further drought tolerance breeding.

On the basis of $sca$ effects for fruit yield per plant, the best crosses were EC310301 X EC164654 (251.33), EC251578 X EC164654 (304.82), IC249512 X IC249503 (381.70), EC162516 X IC249503 (468.85) and EC164845 X IC249505 (571.92) with high positive and significant $sca$ effects under irrigated conditions. Whereas, in stressed condition IC249512 X IC249503 (258.06), IC249512 X EC164654 (260.16), EC310301 X EC164654 (314.06), EC162516 X IC249505 (388.34) and EC164845 X IC249505 (469.54) showed high positive and significant $sca$ effects under moisture stress conditions.

These results suggested that the general and specific combining ability effect of the parents and crosses, respectively cannot be predicted precisely based on their per se performance. Further, there was no direct relationship between the per se performance of the parents and their resultant crosses. Since per se performance is a realized value while $sca$ effect is an estimate, former should be preferred over later during selection of superior cross combinations in early segregating generations.

In the present investigation, the magnitude of $sca$ variance was greater than $gca$ variance and further the ratio of $gca$ to $sca$ was less than unity for all the traits in all the treatments i.e control, 10 days irrigation interval and 15 days irrigation interval except for lycopene content under 10 days irrigation interval. This indicated the predominance of non-additive gene action governing the inheritance of these characters.

There is predominance of non-additive gene action governing the inheritance of most of the traits. Selection for these traits is not effective and reliance should be placed on heterosis breeding. The hybrids EC164845 X IC249505, EC162516 X IC24950), IC249512 X IC249503 and IC249512 X EC164654 exhibited high heterosis, $sca$ effects coupled with good per se performance.

The present study clearly confirmed that in general, wherever increase in fruit yield was obtained under moisture stress the increase in some of the yield components and as well as morpho physiological traits were also present. Studies on heterosis revealed that majority of the hybrids exhibited relative heterosis, heterobeltiosis and standard heterosis in desirable direction. Heterosis manifestation for fruit yield in four crosses viz., EC164845 X IC249505 (35.97), IC249512 X EC164654 (31.20), IC249512 X IC249503 (27.53), and EC162516 X IC249505 (18.72) is primarily due to complementary combination of two or more of the following component traits viz., root length, shoot dry weight, relative water content, proline content, stomatal diffusive resistance and number of fruits per plant.

ABSTRACT

The present investigation entitled “Exploitation of heterosis for growth, earliness, yield and resistance to bacterial wilt in brinjal (Solanum melongena L.)” was carried out during rabi, 2011 to rabi 2013 at Horticultural College and Research Institute, Anantharajupet. The experiment was conducted with a view to screen the available germplasm to identify the bacterial wilt resistant lines, utilizing them in hybridization programme, determining the amount of heterosis, identifying good combining parents and best specific crosses, characterizing the nature and magnitude of gene effects involved in the bacterial wilt resistance, yield and yield components.

Genetic diversity studies of brinjal for sixteen attributes with respect to growth, earliness, yield and bacterial wilt resistance for 50 genotypes of brinjal were carried out during rabi, 2011. The characters average fruit weight, days to last harvest and per cent bacterial wilt incidence were the major contributors towards divergence. In view of very high local preferences for colour, shape, taste and superior performance with regards to yield, two locally preferred cultivars viz., A47 (Gulabi), A46 (Bhagyamati) along with the four bacterial wilt resistant genotypes viz., A48 (Surya), A49 (Arka Neelkanth), A50 (Arka Nidhi) and A45 (Arka Keshav) identified after screening. These were selected as parents for heterosis breeding.

Six parental lines thus identified were crossed in half diallel fashion during kharif, 2012. The resultant fifteen crosses along with six parents and two checks (Arka Anand and Neelima) were evaluated for three seasons viz., summer, kharif and rabi, 2013 for heterosis, combining ability and stability studies so as to identify the promising F1 hybrids with high productivity, good fruit quality and wide adaptability for commercial exploitation.

Combining ability analysis revealed that the magnitude of sca variance was greater than gca variance (the ratio of gca to sca was less than unity) for the characters, plant height, number of branches, days to first flowering, days to 50% flowering, number of flower clusters per plant, number of flowers per cluster, number of fruits per cluster, number of fruits per plant, days to first harvest, days to last harvest, average fruit weight, ascorbic acid, fruit yield per plant and per cent bacterial wilt incidence. This indicated the predominance of non-additive gene action governing the inheritance of these characters. Hence heterosis breeding is ideal to improve these traits. The characters fruit length and fruit width in brinjal were governed by additive gene action indicating efficiency of direct selection for these characters.

Based on gca effects, P2 (Bhagayami) was a superior general combiner for fruit yield and yield components and the parents P3 (Surya) and P4 (Arka Neelkanth) were superior general combiners for bacterial wilt resistance. P3 (Surya) was also a good combiner for fruit width, ascorbic acid and earliness attributes like days to first flower and days to first harvest. Hence, these genotypes are recommended for use in breeding programmes for crop improvement in brinjal. The hybrid C7 (Bhagayami x Arka Neelkanth) was the best specific combiner for most of growth characters.

Studies on heterosis revealed that the hybrids C7 (Bhagayami x Arka Neelkanth), C6 (Bhagayami x Surya) and C5 (Gulabi x Arka Keshav) for fruit yield and resistance to bacterial wilt, C12 (Surya x Arka Keshav) and C6 (Bhagayami x Surya) for ascorbic acid, C7 (Bhagayami x Arka Neelkanth) for number of fruits per plant and C10 (Surya x Arka Neelkanth), C11 (Surya x Arka Nidhi) for earliness characters like days to first flowering, days to 50% flowering and days to first harvest were found to be superior over the better parents.
Significant standard heterosis was recorded for characters like number of branches per plant, number of fruits per plant in cross \( C_7 \) (Bhagyamati x Arka Neelkanth), days to first flowering, days to 50% flowering, days to first harvest in hybrids \( C_{10} \) (Surya x Arka Neelkanth) and \( C_{11} \) (Surya x Arka Nidhi), and ascorbic acid content in hybrids \( C_{12} \) (Surya x Arka Keshav) and \( C_6 \) (Bhagyamati x Surya).

Among the seasons, \textit{rabi} was found to be the best season for growing brinjal as observed from the highest positive environmental indices for most of the growth and yield attributing characters besides manifestation of desirably negative environmental index for bacterial wilt incidence. The hybrid \( C_5 \) (Bhagyamati x Surya) was found to have above average stability for earliness, fruit yield and bacterial wilt resistance and was found specifically adapted to unfavourable environments. The hybrids \( C_2 \) (Gulabi x Surya), \( C_4 \) (Gulabi x Arka Neelkanth), \( C_7 \) (Bhagyamati x Arka Neelkanth), \( C_9 \) (Bhagyamati x Arka Keshav), \( C_{10} \) (Surya x Arka Neelkanth) and \( C_{12} \) (Surya x Arka Keshav) were identified as the stable genotypes as they had high mean value for yield and desirably low mean value for bacterial wilt with unit regression coefficient and hence were proposed for general adaptability.

11. “Studies on combining ability and heterosis for qualitative and quantitative traits in china aster (\textit{Callistephus chinensis} (L.) Nees)” – U. Pavani.

\textbf{ABSTRACT}

The present investigation entitled “Studies on combining ability and heterosis for qualitative and quantitative traits in china aster (\textit{Callistephus chinensis} (L.) Nees)” was carried out during \textit{rabi} 2011 to \textit{rabi} 2013 at Floricultural Research Institute, Rajendranagar, Hyderabad. The eleven genotypes were evaluated and variability studies were carried out for different yield and yield contributing characters in \textit{rabi} 2011. In \textit{rabi} 2012, seven parents from the germplasm showing variability in terms of flower doubleness, flower colour, flower stalk length, earliness in flowering and yield were selected for crossing programme in half diallel fashion (7x7) to study the general combining ability effects of the parents and specific combining ability of the crosses. The 21 hybrids were grown along with their parents and one check variety, Kamini in randomized block design in \textit{kharif} 2013. High estimates of PCV and GCV (>20%) were recorded for most of the characters \textit{viz.}, plant height, number of primary branches per plant, number of secondary branches per plant, fresh weight of the plant, dry weight of the plant, number of ray florets per flower, disc diameter and yield of flowers per plant which indicated a good deal of variability in the germplasm and hence provides sufficient basis for selection. High heritability (>60%) along with high genetic advance as percentage of mean (>20%) for these characters suggested the role of additive gene action signifying the effectiveness of selection of desirable types for improvement. Hence, simple selection based on phenotypic performance of these traits would be more effective. Combining ability analysis revealed that magnitude of \textit{gca} variance was greater than \textit{sca} variance suggesting the predominance of additive gene action for most of the economical characters \textit{viz.}, days taken for first flower opening and 50% flowering, diameter of the disc, number of ray florets per flower, number of flowers per plant, yield of flowers per plant and 1000 seed weight. \textit{Sca} variance was greater than \textit{gca} variance for some of the characters \textit{viz.}, days to first bud initiation, flower stalk length, fresh weight of the flower, seed yield per plant and vase life of flower which indicated predominance of non-additive gene action in their inheritance.

Based on \textit{gca} effects of parents, the parents P.G. White and Poornima were the best general combiners which can be recommended for use in breeding programmes to generate genetic variability in desirable direction. Studies on specific combining ability of the crosses indicated that the cross P.G. Purple x Poornima was the best specific combiner for most
of the characters viz., yield and qualitative characters like number of ray florets, disc diameter and vase life. Studies on heterosis revealed that majority of the hybrids exhibited relative heterosis, heterobeltiosis and standard heterosis in desirable direction. The hybrids exhibiting high per se performance also showed high standard heterosis. Most of the hybrids exhibited superiority over the check regarding flower stalk length and fresh weight of the flower (A.M. Red x P.G. White), disc diameter (P.G. White x Poornima), number of ray florets per flower (A.M. Red x P.G. Purple), flower diameter, number of flowers per plant and yield of flowers per plant (P.G. Purple x Poornima) except for earliness. Hence, these hybrids may have the potential to replace existing local varieties for getting desirable flower characters.

These findings suggested that in china aster, it could be possible to select varieties excelling in yield and quality from the segregating generations following simple pedigree method to achieve yield improvement in this crop through heterosis breeding, involving genetically distant germplasm lines with high or average per se performance, as parents. Further the hybrids exhibiting superiority over the commercial check kamini may have the potential to replace the existing local varieties for getting desirable flower qualities.


ABSTRACT

The present investigation on “Effect of planting time, size of planting material, plant growth regulators and storage methods in garlic (Allium sativum L.) Cv. Jamnagar local” was undertaken with the Jamnagar variety of garlic during 2011-13 at Model Orchard, College of Horticulture, Rajendranagar as three different experiments. The first experiment involved studies on method and date of planting, in addition to size of planting material, while the second experiment consisted of studies on the effect of growth regulators on yield and quality of garlic. The third experiment was on storage in garlic.

Significant differences among the planting methods, planting dates and the size of planting materials were observed for all the characters studied during both the years of investigation. Among the methods of planting, ridge and furrow method of planting (S₂) was consistently superior for sprouting characters; plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, dry matter production and leaf area index and CGR at different growth stages, yield per plant, yield per plot, yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves, per cent large sized bulbs, shoot : bulb ratio, TSS, total sugars, reducing and non-reducing sugars, sulphur content and ascorbic acid content, over the flat bed method of planting (S₁) during both the years of study. Further, planting on October 1st (D₁) was noticed to be uniformly superior for the different sprouting characters; plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production and leaf area index and CGR at different growth stages, yield per plant, yield per plot and yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves, per cent large sized bulbs, and shoot : bulb ratio, TSS, total sugars, reducing and non-reducing sugars, sulphur content and ascorbic acid content studied, over planting in November 1st (D₂) during both the years of study. The results also revealed that planting of 2.5g size cloves (P₄) was 2.0g size cloves (P₃) superior in terms of early sprouting, 50 per cent sprouting and higher per cent of sprouting, greater plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production and leaf area index and CGR at different growth stages; higher yield per plant, yield per plot, yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves, per cent large sized bulbs, and shoot : bulb ratio, TSS, total
sugars, reducing and non-reducing sugars, sulphur content and ascorbic acid content, during both the years of investigation, compared to planting of 1.5g size (P$_2$) and 1.0g size (P$_1$) cloves. The various interaction effects due to method of planting, date of planting and size of planting material were however, found to be non-significant for the sprouting characters, per cent large size bulbs, total sugars, reducing sugars, non-reducing sugars, sulphur content and ascorbic acid content studied in the present investigation. In contrast, the interaction effects were significant for plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production and leaf area index at different growth stages, yield per plant, yield per plot and yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves and shoot : bulb ratio and TSS, during both the years of investigation.

Planting in ridge and furrow method during October with 2.5g sized cloves (S$_2$D$_1$P$_4$) uniformly recorded maximum plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production, leaf area index, CGR, yield per plant, yield per plot and yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves and shoot : bulb ratio and TSS, during both the years of investigation. Further, among the two-way interactions studied, planting in ridge and furrow method during October (S$_2$D$_1$); planting in ridge and furrow method with 2.5g size cloves (S$_2$P$_4$); and planting during October with 2.5g size cloves (D$_1$P$_4$) were also noticed to result in maximum plant height, plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production, leaf area index, CGR, yield per plant, yield per plot, yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves and shoot : bulb ratio and TSS, at all the growth stages, during both the years of investigation. The cost : benefit ratio of different treatments studied in the present investigation revealed maximum gross income and net returns for planting in ridge and furrow method during October with 2.5g sized cloves (S$_2$D$_1$P$_4$), during both the years of investigation, while minimum gross income was recorded for planting in flat bed method during November with 1.0g sized cloves (S$_1$D$_2$P$_1$) during both the years of investigation. However, the net returns were minimum for planting in flat bed method during November with 1.5g sized cloves (S$_1$D$_2$P$_2$) during both the years of investigation. The results also revealed maximum B: C ratio for planting in ridge and furrow method during October with 1.0g sized cloves (S$_2$D$_1$P$_1$), while minimum value was observed for planting in flat bed method in November with 2.5g sized cloves (S$_1$D$_2$P$_4$) during both the years of investigation. In conclusion, early planting in October under ridge and furrow method with large sized cloves had resulted in higher yield and quality of garlic. However, based on benefit : cost ratio, it is desirable to adopt early planting in the first week of October under ridge and furrow method of planting with small sized cloves (1.0g) for realization of optimum yield, quality and returns in garlic.

In the second experiment, the effect of GA$_3$, NAA, Maleic Hydrazide and Cycocel was investigated on sprouting, morphological, yield, yield attributes and quality traits of Jamnagar variety of garlic at different concentrations. The results revealed greater plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production and leaf area index at different growth stages, in addition to higher yield per plant, yield per plot and yield per hectare, bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves, per cent large sized bulbs, and shoot : bulb ratio, along with higher TSS, total sugars, reducing and non-reducing sugars, sulphur content and ascorbic acid content with the application of GA$_3$ at 200, 400 and 600ppm; NAA at 50, 100 and 150ppm; Maleic hydrazide at 500, 1000 and 1500ppm; and cycocel at 500, 1000 and 1500ppm, compared to control, during both the years of investigation. Further, maximum plant girth, number of leaves per plant, fresh and dry weight of leaves per plant, drymatter production and leaf area index at different growth stages,
in addition to yield per plant, yield per plot and yield per hectare, along with bulb girth, bulb fresh and cured weights, number of cloves per bulb, size of cloves, per cent large sized bulbs, and shoot : bulb ratio, TSS, total sugars, reducing and non-reducing sugars, sulphur content and ascorbic acid content were recorded with the application of GA$_3$ @ 200ppm. However, application of MH and cycocel were noticed to result in delayed sprouting along with reduced germination and plant height, compared to control. In conclusion, application of GA$_3$ @ 200ppm had resulted in maximum yield and quality and hence, may be recommended for increasing yield in garlic. Further, NAA @ 50ppm had also resulted in on par yields and quality, compared to GA$_3$ @ 200ppm and in view of its significantly lower cost, compared to GA$_3$ may be recommended in garlic for yield and quality improvement.

The third experiment was undertaken to assess the effect of different packing materials in addition to pre-harvest cultural practices and treatments on shelf-life and quality of garlic. The results revealed minimum physiological weight loss, sprouting per cent, black mould and soft rot incidence for T$_{12}$ treatment at 30, 60, 90, 120, 150 and 180 DAS, during both the years of investigation. The treatments, namely, T$_{16}$, T$_4$ and T$_8$ had also recorded physiological weight loss on par with T$_{12}$ treatment at 30, 60, 90, 120, 150 and 180 DAS, during both the years of investigation. In contrast, maximum physiological weight loss, sprouting per cent, black mould and soft rot incidence was recorded in T$_7$ treatment at 30, 60, 90, 120, 150 and 180 DAS, during both the years of investigation. The treatments, namely, T$_3$ and T$_5$ had also uniformly recorded physiological weight loss on par with T$_7$ at 30, 60, 90, 120, 150 and 180 DAS, during both the years of investigation. Further, a perusal of the results on TSS and sulphur content revealed maximum total soluble solids and sulphur content for T$_{12}$, during both the years of investigation. Further, T$_{16}$ treatment had also recorded total soluble solids and sulphur content on par with T$_{12}$ treatment, during both the years of investigation. In contrast, minimum total soluble solids and sulphur content were recorded in T$_7$ treatment, during both the years of investigation. The T$_5$ and T$_3$ treatments had also recorded total soluble solids and sulphur content on par with T$_7$ treatment, during both the years of investigation. In conclusion, storage of garlic bulbs was found optimum with minimum physiological weight loss, sprouting per cent, black mould and soft rot incidence in addition to high TSS and sulphur content under open storage and plastic net, compared to storage in gunny bags and plastic crates.


ABSTRACT

The present investigation entitled “Effect of sowing time, plant spacing, nitrogen and phosphorus levels on growth yield and quality of carrot (Daucus carota L.) in high altitude tribal zone of Andhra Pradesh” was carried out in two separate experiments viz., ‘Effect of sowing time, spacing and their interaction on growth, yield and quality parameters of carrot cv. Pusa Yamdagni’ and ‘Effect of different levels of nitrogen, phosphorous and their interaction on growth, yield and quality of carrot cv. Pusa Yamdagni’ during rabi 2011-12 and rabi 2012-13 under Factorial RBD at Horticultural Research Station, Pandirimmidi, East Godavari District, Andhra Pradesh. The first experiment was carried out with five different sowing dates viz., September 15$^{th}$, October 1$^{st}$, October 15$^{th}$, November 1$^{st}$ and November 15$^{th}$ with three spacings viz., 20 cm x 10 cm, 30 cm x 10 cm and 40 cm x 10 cm. The second experiment was carried out with 4 levels of nitrogen viz., 0 Kg N ha$^{-1}$, 25 Kg N ha$^{-1}$, 50 Kg N ha$^{-1}$ and 75 Kg N ha$^{-1}$ in combination with 4 levels of phosphorus i.e., 0 Kg N ha$^{-1}$, 20 Kg N ha$^{-1}$, 40 Kg N ha$^{-1}$ and 60 Kg N ha$^{-1}$. The above experiments were aimed to ascertain the best sowing date,
suitable spacing as well as optimum N and P levels which will give high yield coupled with better root quality in high altitude tribal zone of Andhra Pradesh.

Different dates of sowing shown significant influence on the vegetative growth in terms of plant height, number of leaves, fresh and dry weight of aerial parts in both the years of study which has recorded highest values by the crop sown on 15th October. The yield and yield contributing characters like root fresh weight, root dry weight, root length, root diameter and per hectare yield were also recorded highest in the plants sown on 15th October in both the years. The maximum per hectare yields recorded was 19.08 t ha\(^{-1}\) and 18.63 t ha\(^{-1}\) during first and second year respectively with 15th October sowing. Significant differences were observed due to the effect of sowing time on quality parameters like total soluble solids and carotene content which was recorded highest values with 15th October sowing.

Among the three different spacings tried, the highest plant height and number of leaves at different growth stages were recorded in the plants spaced at 40 cm x 10 cm. All the yield contributing characters like fresh weight of root, root length and root diameter were also recorded significantly highest values with the same 40 cm x 10 cm spacing, whereas, the per hectare yields were recorded maximum at 20 cm x 10 cm spacing with 19.06 t ha\(^{-1}\) and 18.73 t ha\(^{-1}\) during first and second year respectively. The observations on quality parameters had shown non-significant results with respect to the different spacings except for total soluble solids which had shown an increasing trend with increase in spacing and recorded the highest TSS of 11.30° Brix during the first year and 11.81° Brix during the second year at 40 cm x 10 cm spacing.

The interaction effect between dates of sowing and spacing was found to be significant in both the years of study with respect to all the growth parameters. The combination of 15th October sowing with 40x10 cm spacing recorded the highest plant height, number of leaves and fresh weight of aerial parts. The yield related characters were also influenced significantly due to the interaction of different sowing dates and spacings. The combination of 15th October sowing with 40cmx10cm spacing recorded significantly higher values for root length (13.90 and 14.26 cm during first year and second year respectively). Similarly root diameter (4.56 cm in first year and 4.50 cm in second year), root fresh weight (77.41 g/plant and 79.75 g/plant during first year and second year respectively) were also recorded highest in the plants grown on 15th October at the spacing of 40 cm x 10 cm and the minimum of these parameters were found in the plants sown on 15th September at the spacing of 20 cm x 10 cm. However, the highest yield per hectare was observed in 15th October sown plants spaced at 20 cm x 10 cm which recorded 23.24 t ha\(^{-1}\) and 22.91 t ha\(^{-1}\) during first and second year respectively. With respect to the quality parameters studied the interaction effect between dates of sowing and spacing was found to be non significant in both the years of study for all the parameters studied.

Significant variation in results were observed due to different nitrogen and phosphorus levels on growth, yield and quality of carrot in second experiment.

Different nitrogen levels had shown significant influence on the plant growth parameters with respect to plant height, number of leaves and fresh weight of aerial parts which were significantly increased with increasing levels of nitrogen. The highest values for all these parameters were recorded with maximum rate of nitrogen application (75 Kg N ha\(^{-1}\)) during both the years. The yield contributing characters like root fresh weight, root dry weight, root length, root diameter were also recorded highest with maximum rate of nitrogen application (75 Kg N ha\(^{-1}\)). The per hectare yields were also recorded highest with 75 Kg N application
which recorded 19.40 t ha\(^{-1}\) and 20.00 t ha\(^{-1}\) during first and second year respectively. Significant differences were observed due to the effect of different nitrogen levels on quality parameters of carrot. Total soluble solids, carotene content, reducing sugars, non-reducing sugars and total sugars were increased with increasing rate of N application. Similarly the increasing rate of N has increased the nitrogen uptake in all the plant parts.

The influence of different levels of phosphorus on plant growth parameters was significant in both the years. The plant height, number of leaves and fresh weight of aerial parts were significantly increased with increasing levels of phosphorus. Among the four graded levels of phosphorus, application of 60 Kg P ha\(^{-1}\) recorded the highest values in all these parameters. The yield contributing characters like root fresh weight, root dry weight, root length, root diameter were also increased with increasing rate of P application and the maximum values were recorded at 60 Kg P ha\(^{-1}\). The per hectare yields were also recorded highest with application of 60 Kg P ha\(^{-1}\) which recorded 15.90 t ha\(^{-1}\) and 16.94 t ha\(^{-1}\) during first and second year respectively. However, different phosphorus levels had shown no influence on the quality parameters studied in carrot during both the years. The P uptake in the plant was increased with increasing levels of P and recorded maximum at P3 (60 Kg P ha\(^{-1}\)).

The interaction effect between N and P levels was found to be significant in both the years of study with respect to growth parameters. The combination of 75 Kg N ha\(^{-1}\) and 60 Kg P ha\(^{-1}\) recorded highest values in plant height, number of leaves and fresh weight of aerial parts. The yield related characters were also influenced significantly due to the interaction of different N and P levels. The combination of 75 Kg N ha\(^{-1}\) and 60 Kg P ha\(^{-1}\) recorded significantly higher values for root length (13.67 and 14.03 cm during first year and second year respectively). Similarly root diameter (4.44 cm in first year and 4.51 cm in second year), root fresh weight (95.76 g/plant and 97.00 g/plant during first year and second year respectively) were also recorded highest with the combination of 75 Kg N ha\(^{-1}\) and 60 Kg P ha\(^{-1}\) and the minimum of these parameters were found in the combination of treatment where no N and P fertilizers were applied. The per hectare yield was also recorded maximum in the combination of 75 Kg N ha\(^{-1}\) and 60 Kg P ha\(^{-1}\) which recorded 20.73 t ha\(^{-1}\) and 20.05 t ha\(^{-1}\) during first and second year respectively. With respect to the quality parameters studied, the interaction effect between N and P levels was found to be non-significant in both the years for all the parameters studied viz., TSS, carotenoid content, reducing sugars, non-reducing sugars, total sugars and shelf life. Similarly, NPK uptake in plant and available NPK in the soil were also not significantly influenced by the interaction between N and P levels.

In the experiment on different sowing times and spacings, highest Benefit Cost Ratio (BCR) was recorded with the treatment combination of 15\(^{th}\) October sowing with 20cm x 10 cm spacing, which were recorded as 4.37 and 4.31 during the first and second year respectively. In the experiment on different levels of N and P, the combination of 75 kg N ha\(^{-1}\) with 60 kg P ha\(^{-1}\) recorded the highest Benefit Cost Ratio (BCR), which were recorded as 3.81 and 4.00 during the first and second year respectively.

ABSTRACT

The experiment entitled “EVALUATION OF PRE AND POST EMERGENCE HERBICIDES FOR THEIR EFFICACY AND SELECTIVITY IN ONION AND TOMATO CROPS” was conducted at the College farm of Horticultural college and Research Institute, Venkataramannagudem, W.G (dt), A.P during the year 2011-12 and 2012-13.

In both Onion and Tomato crops weed management practices exerted their significant effect on density of weeds viz., grasses, sedges, and BLWs and Total weeds, dry matter of weeds at various stages of crop growth. These attributes found to be maximum with T10 (unweedy check), while T9 (Weed free-hand weeding at 20, 40 and 60 DAT) registered lower values followed by Pre emergence herbicides either Pendimethalin @ 0.75 kg a.i / ha or Oxyfluorfen @ 0.125 kg a.i / ha coupled with Quizalofop ethyl @ 75 g a.i / ha found to be effective in decreasing the weed population and dry matter of weeds to a greater extent.

Highest weed control efficiency and lowest weed index values were observed with T9 (Weed free-hand weeding at 20, 40 and 60 DAT) followed by chemical weed control (Pendimethalin @ 0.75 kg a.i / ha as PE or Oxyfluorfen @ 0.125 kg a.i / ha as PE combined with Quizalofop ethyl @ 75 g a.i / ha as POE) treatments.

Maximum depletion of NPK by the weeds was found in T10 (unweedy check) during various stages of crop growth. Chemical weed control (Pendimethalin @ 0.75 kg a.i / ha as PE or Oxyfluorfen @ 0.125 kg a.i / ha as PE combined with Quizalofop ethyl @ 75 g a.i / ha as POE) was found better in reduction of NPK removal by the weeds next to T9 (Weed free-hand weeding at 20, 40 and 60 DAT).

In Onion growth attributes viz., Number of leaves per plant, LAI, Plant dry matter and yield attributing characters viz., average bulb weight, bulb diameter, Neck diameter, bulb height are found to be higher with application of Pendimethalin @ 0.75 kg a.i / ha as PE in conjunction with Quizalofop ethyl @ 75 g a.i / ha as POE next to T9 (Weed free-hand weeding at 20, 40 and 60 DAT).

In Tomato chemical weed control treatments either Oxyfluorfen @ 0.125 kg a.i / ha or Pendimethalin @ 0.75 kg a.i / ha coupled with Quizalofop ethyl @ 75 g a.i / ha as POE registered maximum values for growth parameters viz., plant height, number of branches per plant, LAI, plant dry matter and yield attributes viz., number of fruits per plant, fruit yield per plant, average fruit weight and fruit yield next to T9 (Weed free-hand weeding at 20, 40 and 60 DAT).

The nutrient uptake (NPK) by the onion and tomato crops were significantly highest with T9 (Weed free-hand weeding at 20, 40 and 60 DAT) followed by chemical weed control treatments.

Quality parameters viz., ascorbic acid in tomato, total soluble solids (TSS), sprouting (%) and rotting (%) in onion were not affected due to herbicide application.

In both Onion and Tomato crops Pendimethalin @ 0.75 kg a.i / ha or Oxyfluorfen @ 0.125 kg a.i / ha in combination with Quizalofop ethyl @ 75 g a.i / ha as POE gave maximum
benefit cost ratio over hand weeding at 20,40 and 60 DAT. Though Imazethapyr @ 60 g ai ha\(^{-1}\) as POE was effective in controlling the weeds as evident from weed dry matter but found to be highly toxic to the Onion and Tomato.

15. “Genetic diversity, heterosis, combining ability and stability analysis for yield and yield components in purple brinjal”- V. Chaitanya.

ABSTRACT

The present investigation entitled “Genetic diversity, heterosis, combining ability and stability analysis for yield and yield components in purple brinjal” was undertaken to identify diverse parents, study the combining ability, heterosis and stability of experimental hybrids for yield and yield components in brinjal.

During rabi 2012, fifty one genotypes were evaluated for genetic diversity at Vegetable Research Station, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad. On the basis of the mean performance of the genotypes among traits studied, the following were identified as promising lines for further crop improvement in brinjal viz., \(A_{14}\) (IC-281104), \(A_{43}\) (IC-439263), \(A_{44}\) (IC-090084) and \(A_{47}\) (IC-090084-2).

Based on genetic variability studies, high PCV and GCV and high heritability coupled with high genetic advance as per cent of mean were recorded for fruit length, fruit width, average fruit weight, total number of fruits per plant, number of marketable fruits per plant, total yield per plant, marketable yield per plant and ascorbic acid content indicating the existence of wider genetic variability for these traits in the genotypes under study.

The traits ascorbic acid content, average fruit weight and total number of fruits per plant were the major contributors towards divergence. Based on Mahalanobis \(D^2\) analysis the fifty one genotypes were grouped into eight clusters. The pattern of distribution of genotypes into various clusters revealed that there was no relationship between geographical distribution and genetic diversity. Greater genetic divergence was between clusters V and VIII, suggested exploitation of these two clusters by intermating genotypes in a definite breeding designs to explore the fullest range of heterosis and to realize good recombinant lines. Based on this study horticulturally superior genotypes viz., \(A_{14}\) IC-281104, \(A_2\) IC-021621, \(A_{22}\) IC-127024, \(A_{47}\) IC-090084-2, \(A_{48}\) IC-090084-4, \(A_{36}\) IC-090783-3 and \(A_3\) IC-23771 were selected for hybridization programme as they were expected to produce high heterotic crosses.

Correlation and path coefficient analysis studies revealed positive correlation and direct effect on marketable fruit yield per plant exhibited through fruit length, average fruit weight, total number of fruits per plant and number of marketable fruits per plant.

Seven parental lines thus identified were crossed in half diallel fashion during summer, 2013. The resultant twenty one crosses along with seven parents and two checks (Chhaya and Utkarsha) were evaluated in three seasons viz., kharif, rabi and summer, 2013-14 for combining ability, heterosis and stability studies so as to identify the promising \(F_1\) hybrids with high productivity, good fruit quality and wide adaptability for commercial exploitation.

The pooled analysis of variance for combining ability analysis revealed significant differences due to environments, parents, hybrids and various interactions indicating the existence of wider variability in the material under studied. The ratios of \(GCA / SCA\) variances revealed that non-additive gene action was predominant in the inheritance of all the characters.
except fruit length, fruit width and average fruit weight. Hence heterosis breeding is ideal to improve these traits.

The $gca$ effects of the parents in pooled analysis revealed that $P_2$ IC-021621 was found to be promising general combiner for marketable fruit yield per plant and other traits and $P_6$ (IC-090783-3) was a good general combiner for earliness attributes whereas $P_1$ (IC-281104) was a good general combiner for days to last fruit harvest and less incidence of fruit and shoot borer infestation on fruits. Based on significant $sca$ effects, five hybrids viz., $C_3$ (IC-281104× IC-090084-2), $C_{11}$ (IC-021621× IC-23771), $C_{13}$ (IC-127024× IC-090084-4), $C_{16}$ (IC-090084-2× IC-090084-4) and $C_{21}$ (IC-090783-3× IC-23771) were identified as promising for marketable fruit yield per plant and other traits.

Based on per se performance, $sca$ effects, heterobeltiosis and standard heterosis for yield and its attributes in pooled analysis, five cross combinations viz., $C_3$ (IC-281104× IC-090084-2), $C_{11}$ (IC-021621× IC-23771), $C_{13}$ (IC-127024× IC-090084-4), $C_{16}$ (IC-090084-2× IC-090084-4) and $C_{21}$ (IC-090783-3× IC-23771) proved to be superior for yield and yield contributing characters.

Among the seasons, rabi was found to be the best season for growing brinjal as observed from the highest positive environmental indices for most of the growth and yield attributing characters besides manifestation of desirably negative environmental index for fruit and shoot borer infestation on fruits. The hybrids $C_3$ (IC-281104× IC-090084-2), $C_{11}$ (IC-021621× IC-23771), $C_{13}$ (IC-127024× IC-090084-4) and $C_{21}$ (IC-090783-3× IC-23771) are identified as stable with desirable $sca$ effects, heterosis and per se performance for marketable yield per plant and other important attributes. These hybrids may be further tested over locations, seasons and years and recommended for commercial release.


**ABSTRACT**

Two experiments were conducted at HRS, Lam with an objective of studying combining ability of the parents and crosses, to estimate the magnitude of heterosis and to assess the stability of resulting hybrids for yield and yield components. The investigation was undertaken with an aim to develop heterotic hybrids with wider adaptability.

The pooled analysis of variance for combining ability revealed significant differences due to environment, parents and hybrids and various interactions indicating the existence of wide variability in the material studied. The ratio of $gca$ to $sca$ variances revealed that non-additive gene action was predominant over additive gene action in the inheritance of all the characters studied except plant spread, fruit length, fruit diameter, average dry fruit weight, dry fruit recovery and seed weight.

The $gca$ effects of the parents in pooled analysis revealed that the lines LCA 764 and LCA 704 and the testers LCA 703 and LCA 315 were promising general combiners for fruit yield and other yield contributing traits. All these parents were considered to be contributing maximum positive alleles for the increase of fruit yield per plant.

Based on the $sca$ effects in pooled analysis, eight hybrids viz., LCA 625× LCA 706, LCA 764× LCA 315, LCA 764× LCA 763, LCA 704× LCA 315, LCA 710× LCA 706, LCA 718× G4, LCA 712× LCA 763 and LCA 712× LCA 703 were identified as promising for fruit yield per plant and other characters.
Among the twenty one characters studied for stability, the GE interactions were significant for ten characters viz., plant height, plant spread, per cent fruit set, no. of fruits per plant, fruit length, average dry fruit weight, dry fruit yield per plant, seed weight, vitamin C and capsaicin value implying differential behaviour of genotypes under three locations for these characters.

Environmental indices revealed that Lam location was found to be the most favourable location for plant height, plant spread, no. of fruits per plant, dry fruit yield per plant and capsaicin content, while V.R.Gudem was the most favourable for per cent fruit set, fruit length and average dry fruit weight. The Darsi location was the most favourable for seed weight and vitamin C.

From the present study on stability, seven hybrids viz., LCA 704 x LCA 315, LCA 704 x LCA 703, LCA 764 x LCA 315, LCA 712 x LCA 703, LCA 704 x LCA 706, LCA 710 x LCA 706 and LCA 625 x LCA 706 possessed higher fruit yield than the standard checks and were identified as stable hybrids for fruit yield per plant and other traits.

Based on the present study, it can be concluded that five hybrids viz., LCA 704 x LCA 315, LCA 764 x LCA 315, LCA 712 x LCA 703, LCA 764 x LCA 763 and LCA 710 x LCA 706 were observed to be stable with desirable sca effects, heterosis and per se performance for fruit yield and other important traits.


ABSTRACT

The present investigation was carried out during rabi 2012 and 2013 in the vertisols of Horticultural Research Station, Lam, Guntur to ascertain the best sowing date, suitable plant density, optimum N and P application levels to get high yield and quality in nigella. The study consisted of five different sowing dates (1st fortnight of October, 2nd fortnight of October, 1st fortnight of November, 2nd fortnight of November and 1st fortnight of December) with three plant densities (25, 33.3 and 50 plants m-2), four levels of nitrogen (0, 20, 40 and 60 kg nitrogen (N) ha-1) and phosphorus (0, 15, 30 and 45 kg phosphorus (P) ha-1) as sub plots. The different dates of sowing had no influence on the germination. However, lower field emergence was observed in the crop sown beyond 1st fortnight of November. The dates of sowing and plant densities had significant influence on the morphological, growth, yield and quality attributes. The interaction was non-significant for all the characters studied. Irrespective of the year of the study, shorter plants with less number of leaves and branches were recorded when the crop sown beyond 1st fortnight of November and with 50 plants m-2. Fresh and dry matter accumulation at different growth stages in the first three dates of sowings was on par, and then declined significantly. These attributes were lowest in the plant density of 50 plants m-2. The total chlorophyll content was minimum in the crop sown during the first fortnight of December at a density of 50 plants m-2. Maximum fresh and dry matter accumulation, LAI and CGR were recorded at 30, 60, and 90 DAS when the crop was sown between 1st fortnight of October to 1st fortnight November declined thereafter. Minimum fresh and dry matter accumulation, and maximum Leaf Area Index (LAI) and Crop Growth Rate (CGR) when the crop was sown at 50 plants m-2.
Yield contributing characters like fresh weight of capsule, capsule weight capsule, test weight, capsule yield per plant, grain yield per plant and husk yield per plant were maximum in the crop sown between 1st fortnight of October to 1st fortnight of November than the crop sown later. These attributes were minimum in the crop sown at 50 plants m-2 density. Maximum seed yield (q ha-1), stalk yield (g m-2), fixed oil yield (kg ha-1) and essential oil yield (L ha-1) were recorded in the first three dates of sowing at 50 plants m-2 density. The essential oil and fixed oil contents were lower in the last two sowings.

Maximum fixed oil content was recorded with the plant density of 25 and 33.33 plants m-2. Early sowing and lower plant densities favoured linoleic acid production. Seed protein and carbohydrate contents increased with delay in sowing. Lowest protein and highest carbohydrate contents were observed at 50 plants m-2. The volatile oil contained 28 compounds including thymoquinone. Linoleic acid content was highest in seed metabolites. The GCMS profile of volatile seed metabolites was similar in first three sowings. The thymoquinone content was higher when the crop was sown in early at plant density of 25 plants m-2.

The study on application of graded levels of nitrogen and phosphorus revealed that all the traits except seed moisture and fibre content were influenced by N and P application. There was interaction effect in the traits like plant height (60, 90 DAS and at harvest), total chlorophyll content, LAI (90 DAS), CGR (90 DAS), capsule yield, husk yield, stover yield, ash content of seed, N uptake, P uptake and K uptake. N and P application levels improved the plant height, number of leaves per plant and number of branches per plant at different stages of growth. Similar response was observed in fresh and dry matter accumulation. Minimum total chlorophyll content, LAI and CGR were recorded without fertilizer supplementation. The yield contributing characters like fresh weight of the capsule, capsule weight at harvest, capsule length and diameter, number of capsules, number of seeds per capsule, test weight, capsule yield per plant and grain yield per plant increased with level of application of N and generally maximum values were observed in highest N application.

Similar response was observed with P application. Seed yield and stalk yield were maximum in highest N application during the years of the study. Seed yield was maximum with the application of phosphorus 45 and 30 kg ha-1. The essential oil and fixed oil yield increased with application of N and P. Further, N and P applications influenced the content of essential and fixed oil content positively. The seed protein and ash content increased with the increase in N and P applications where as carbohydrate content decreased. The linoleic acid production was associated with low levels of N application. There was no linear dependence for some of the volatiles on the N application but negatively correlated with P application.

The thymoquinone content was maximum at 20 kg N ha-1 application without any P application. The uptake of N, P and K increased with the increase of N and P applications. Lower available nitrogen and potassium, and higher available phosphorus status was observed after harvest than initial soil status. The highest Benefit Cost Ratio (BCR) was recorded with the crop sown during at harvest, capsule length and diameter, number of capsules, number of seeds per October at 50 plants m-2 density (25 x 10 cm spacing). The application of 60 kg N ha-1 in two splits as basal and at 35 DAS with 30 P kg ha-1 as basal recorded the highest BCR among the graded levels of N and P.
“Studies on heterosis, combining ability and stability for yield and its components in brinjal (Solanum melongena L.)” – V. Sivakumar.

ABSTRACT

The present investigation was undertaken to estimate the magnitude of heterosis, combining ability effects of the parents and crosses and assess the stability of hybrids for yield and yield components. Seven elite lines viz., IC 090053, IC 285140, IC 421194, IC 90806, Heera and Pusa Shyamala were crossed with three diverse testers viz., Bhagyamathi, Gulabi and Shyamala and the resultant twenty one hybrids along with parents and three checks viz., Ravaiyya, Kanaka Durga and US 172 were evaluated for combining ability (Line x Tester design), heterosis and stability at three locations viz., Venkataramannagudem, Pandirimamidi and Aswaraopet during summer, 2013-14. Data were recorded on eighteen quantitative traits viz., plant height, number of primary branches per plant, days to 50% flowering, days to first harvest, days to final harvest, number of flowers per cluster, number of fruits per cluster, fruit length, fruit girth, fruit length to girth ratio, average fruit weight, number of fruits per plant, fruit yield per plant, estimated fruit yield per hectare, shelf life, ascorbic acid content, total phenols and fruit borer infestation.

On the basis of per se performance, crosses Heera x Bhagyamathi (5.15kg), Heera x Shyamala (5.11 kg), Heera x Gulabi (4.98 kg), Pusa Shyamala x Gulabi (4.74 kg), IC 421194 x Gulabi (4.04 kg), IC 90806 x Gulabi (3.97 kg) and IC 90806 x Bhagyamathi (3.86 kg) were found to be the most promising hybrids for fruit yield per plant and other desirable traits over three checks, Ravaiyya (2.68 kg), Kanaka Durga (2.51 kg) and US 172 (3.80 kg). Significant standard heterosis over three checks with regard to fruit yield and its components were recorded by crosses viz., Heera x Bhagyamathi, Heera x Shyamala, Heera x Gulabi, Pusa Shyamala x Gulabi and IC 285140 x Bhagyamathi in positive direction.

The pooled analysis of variance for combining ability revealed significant differences due to environments, parents, hybrids and various interactions indicating the existence of wide variability in the material studied. The ratio of gca to sca variances revealed that non-additive gene action was predominant over additive gene action in the inheritance of all the characters studied except days to final harvest, fruit length, fruit girth, fruit length to girth ratio and average fruit weight, in which additive gene action was predominant.

The gca effects of the parents in pooled analysis revealed that the lines Pusa Shyamala and Heera and the testers Bhagyamathi and Gulabi were promising general combiners for fruit yield and other yield contributing traits. Based on the sca effects in pooled analysis, five hybrids viz., IC 285140 x Bhagyamathi, Pusa Shyamala x Gulabi, Heera x Bhagyamathi, Heera x Gulabi and Heera x Shyamala were identified as promising crosses for fruit yield per plant and other characters. Results of stability analysis revealed that seven hybrids viz., Heera x Bhagyamathi, Heera x Shyamala, Heera x Gulabi, Pusa Shyamala x Gulabi, IC 421194 x Gulabi, IC 90806 x Gulabi and IC 90806 x Bhagyamathi showed higher fruit yield than the checks and were identified as stable hybrids for fruit yield per plant and other traits.

Based on the present study, it can be concluded that five hybrids viz., Heera x Bhagyamathi, Heera x Shyamala, Heera x Gulabi, Pusa Shyamala x Gulabi and IC 285140 x Bhagyamathi are stable with desirable sca effects, heterosis and per se performance for fruit yield and other important traits. These hybrids may be further tested over locations and seasons before recommending for commercial release.
ABSTRACT

The investigation was planned and executed in the Grape Research Station, Rajendranagar, Dr. Y.S.R. Horticultural University during the year 2012–14, to study the influence of harvesting dates, antioxidants (ascorbic acid, AA and benzyl adenine, BA) with alkaline emulsion of ethyl oleate (AEEO) pre-drying treatments and storage temperature (5±1°C, 18±1°C and ambient condition) on recovery and quality of dried off (tray dried) or dried-on-vine (DOV) raisins prepared from five seedless varieties of grapes viz., Thompson Seedless, 2A Clone, Sonaka, Manik Chaman and Merbein Seedless. The four experiments were laid out in factorial completely randomized design with three replications. The raisins was evaluated for quantitative and qualitative characteristics viz., green, brown and mixed colored raisins, raisin recovery, average raisin weight, raisin yield, drying rate, drying time, raisin size, raisin surface texture, moisture content, total soluble solids (TSS), acidity, brix-acid ratio, sugars (total, reducing, non-reducing), ascorbic acid, Hunter color L*, (lightness), a* and b* values, weight loss and sensory attributes.

Harvest date results showed that raisins prepared from well matured grapes i.e. harvested between 19th April to 1st May claimed lowest brown and mixed colored raisins, and correspondingly increased green colored raisins. Significantly maximum raisin recovery of 26.20% was recorded in Thompson Seedless harvested on 19th April. Raisin weight, yield, size, TSS, brix-acid ratio, sugars and Hunter color L*, -a* (greenness) and b* (yellowness) values increased with succeeding harvest dates and recorded maximum in fifth harvest. Thompson Seedless raisins were superior compared to others in term of quality. The drying ratio, drying time, moisture content and acidity were lowest in fifth (19th April to 1st May). The grapes dried early in cultivar Merbein Seedless and it takes only 13.27 days to dry followed by 2A Clone, Thompson Seedless, Manik Chaman and Sonaka in order. The organoleptic score for color and appearance, texture, flavour, taste and overall acceptability of raisins was noted by the Panelists and maximum recorded in Manik Chaman which was comparable with Thompson Seedless.

The grapes were dried in ventilated rooms in trays after pre-drying treatment with various concentrations of antioxidants (500, 750 and 1000 ppm of AA and 50, 100, 150 ppm of BA) with alkaline emulsion of ethyl oleate, among which AEEO with AA 1000 ppm showed maximum recovery, greenness, weight, yield, size, TSS, brix-acid ratio, sugars and lowest drying ratio, drying time, acidity, brown and mixed colored raisins. Raisins prepared by AEEO with AA 1000 ppm as a pretreatment showed their effectiveness to retain higher L*, -a* (greenness) and b* (yellowness) values, color homogeneity and sensory attributes. Regarding varieties, Thompson Seedless raisins were superior for studied characteristics. The Manik Chaman raisins were superior for sensory attributes, which was on par with Thompson Seedless whereas it was lowest for Sonaka.

For dry-on-vine (DOV) raisin making, AEEO with AA 1000 ppm pre-drying treatment showed their effect to record highest average raisin weight, raisin yield, raisin size, TSS, brix-acid ratio, sugars (total, reducing and non-reducing), ascorbic acid and L*, a* and b* values. Significantly highest ascorbic acid content and lowest acidity and moisture content of raisins was recorded in AEEO with AA 1000 ppm pretreatment. Regarding varieties, Manik Chaman were superior for DOV raisin making with their rich contribution of bright colour and excellent
raisin qualities, which was comparable with Thompson Seedless. The results also revealed that Merbein Seedless is dried in short time, it was taken 20.03 days to dry followed by 2A Clone, Thompson Seedless, Manik Chaman and Sonaka.

The raisins stored at 5±1°C in 400 gauge LDPE bags recorded maximum moisture content, TSS, brix-acid ratio, sugars, ascorbic acid and L*, a* and b* values. Raisins stored at 5±1°C retained greenness upto 93.68 days followed 18±1°C (78.38 days), whereas at ambient condition the greenness retained only 35.09 days. With respect to varieties, Thompson Seedless raisins were good for retention of greenness (77.46 days) and quality during storage. The quality of raisins was decreased with advancement of storage temperature and storage period.

From this finding it can be concluded that the Thompson Seedless bunches were harvested between 9th to 19th April in Hyderabad area, then dipped in AEEO with ascorbic acid 1000 ppm as a pre-drying treatment and raisins stored in 5±1°C in 400 gauge LDPE bags was retained maximum greenness as well as quality of raisins.


ABSTRACT

The present investigation was carried out to evaluate the genetic diversity in thirty four mango cultivars with fruit morphological, bio-chemical characters and molecular markers.

Analysis of variance on thirty fruit morphological quantitative traits revealed significant differences among thirty four cultivars for almost all the characters studied thus indicating wide variation among the cultivars. The high values of PCV and GCV observed for fruit morphological and bio-chemical characters indicated that the variability observed among the mango cultivars was high. High heritability coupled with high genetic advance was recorded for almost all characters indicating the role of additive gene action governing the inheritance of these traits.

Multivariate analysis following Mahalanobis $D^2$ statistic grouped the entire germplasm into six distinct clusters. The highest inter cluster $D^2$ value was recorded between clusters III and VI indicating that the cultivars of these clusters are highly divergent. Principal component analysis recognized seven principal components (PCs) with eigen values more than one which contributed 82.04 per cent of cumulative variance.

The RAPD analysis with fifteen primers produced 100 per cent polymorphism with an average of 11.8 polymorphic bands per primer and detected a moderate level of genetic variation among mango cultivars with average similarity coefficient of 0.78. The UPGMA analysis grouped the cultivars into two main clusters $vìz.$, cluster I (twenty nine cultivars) and cluster II (five cultivars).

In total, sixty five alleles were detected using eighteen SSR primers with similarity coefficient values ranged from 0.65 to 0.88. UPGMA analysis grouped the cultivars into two main clusters $vìz.$, cluster I (twenty six cultivars) and cluster II (eight cultivars).

In combined RAPD and SSR marker analysis, the accessions within a cultivar formed a sub cluster indicating the origin of these cultivars from a single ancestor. Similarly, the cultivars are separated based on geographic origin. Though morphological and molecular characterization methods (RAPD and SSRs) were found efficient in grouping cultivars, and formed separate groups, the combined molecular analysis was more accurate than morphological and individual marker analysis.
ABSTRACT

The present investigation, “Studies on the diversity in morphological, bio-chemical and molecular characterization in sapota genotypes”, was carried out during 2013-2014 at Horticultural Research Station, Venkataramannagudem, Andhra Pradesh. Genetic diversity was evaluated in thirty three genotypes of sapotaby tree morphological, fruit bio-chemical and molecular markers. Twenty four RAPD and sixteen SSR markers were employed to analyze the molecular diversity among the genotypes.

The analysis of variance for the twenty three quantitative traits revealed significant differences for all the characters studied thus indicating wide variation among the genotypes. The genotype Kirthibarthi recorded maximum plant height, while the genotype Cricket Ball recorded maximum leaf length, leaf width, leaf area and seed weight. The mean fruit length was highest in PKM-4 and maximum fruit width, fruit weight and pulp to seed ratio was recorded in Columbian Sapota. The genotype Tagarampudi recorded highest per cent fruit set and yield/tree. Further, the genotype PKM-4 recorded maximum TSS and total sugars, while maximum reducing sugars was reported in Kalipatti and highest non-reducing sugars was recorded in the genotype CO-2. Highest amount of ascorbic acid content was recorded in CO-1, while maximum titrable acidity and pectin was reported in Mirandi. Further, the genotype Krishna Rao recorded highest per cent fruit set and yield/tree.

The characters, namely, fruit weight, seed number, seed weight, pulp to seed ratio, per cent fruit set, yield per tree, non-reducing sugars, ascorbic acid, TSS to acid ratio and pectins had recorded higher estimates for phenotypic coefficient of variation, genotypic coefficient of variation, heritability and genetic advance as per cent mean.

Correlation coefficient and Path coefficient analysis revealed that the association of plant height, leaf width, leaf area, fruit length, per cent fruit set with yield/tree and among themselves was positive and highly significant and these traits were identified as fruit yield components and exerted high positive direct influence on yield per tree. Similarly the association of TSS, total sugars, reducing sugars, non-reducing sugars, ascorbic acid and TSS to Acid ratio with yield per tree among themselves was positive and highly significant. This indicated that direct selection of yield improvement through these traits would be rewarding.

In $D^2$ analysis, the characters viz., leaf width, leaf area, fruit length, per cent fruit set, TSS, total sugars, non-reducing sugars, ascorbic acid and TSS to Acid ratio contributed more for the divergence. In PCA, the characters viz., yield per tree, total sugars, TSS, ascorbic acid, titrable acidity, TSS to Acid ratio, phenols and per cent fruit set in PC1 contributing more towards variability.

The RAPD analysis with twenty four primers produced 204 polymorphic bands with an average of 8.2 polymorphic bands per primer. Out of total 204 polymorphic bands, thirteen bands were unique to particular genotype viz., Gutti (OPC-2), Tagarampudi and PKM-4 (OPG-3), Calcutta Round, Columbian Sapota and Cricket Ball (OPG-4), Pakala Oval (OPG-7), DHS-2 (OPV-9), DHS-1 (OPV-10), Columbian Sapota (OPX-3), Cricket Ball (OPX-11), Kalipatti
and Pakala Round (OPX-12) which could be exploited for DNA fingerprinting of these accessions by converting RAPD markers into STS markers and this was highly useful for detecting mixes between genotypes.

Eighty eight alleles were produced by examining the 33 sapota genotypes with sixteen microsatellite loci with an average number of 2.66 alleles per locus. High level of polymorphism was observed with primers SSR S-4 and SSR Mh-12. The PCR product size obtained by amplification of SSR primers was ranged from 135 to 555 bp. Out of the total 88 polymorphic alleles, twenty one fragments were unique to particular genotypes viz., Columbian Sapota, DHS-1 and DHS-2 (SSR S-1), CO-3 (SSR S-2), Pakala Round (SSR S-3), Seedless (SSR S-4), PKM-2 (SSR S-5), DHS-1 and DHS-2 (SSR S-7), Cricket Ball, Calcutta Round and CO-2 (SSR S-8), Gavarayya (SSR S-9), Singapore, DHS-1 and PKM-2 (SSR S-10), CO-2 (SSR Mh-26), Bombay (SSR Mh-20), Kalipatti and Pakala Round (SSR Mh-12) and Pala (SSR Mh-17) which could be exploited for DNA fingerprinting of these genotypes. Based on outcome of the present investigation, it can be concluded that molecular markers for fingerprinting as well as estimation of genetic diversity and genetic relatedness in sapota genotypes is effective, precise and more efficient than morphological markers.

22) “Studies on standardization of production techniques in tuberose (polianthes tuberosa L.) CV. Suvasini” T.Suseela

ABSTRACT

The present investigation entitled “Studies on Standardization of production techniques in Tuberose (Polianthes tuberosa L.) cv. Suvasini” was carried out at Horticultural College and Research Institute, Dr. Y.S.R Horticultural University, Venkataramannagudem, West Godavari District of Andhra Pradesh for two consecutive years during the period from 2012-2014. For this study, five experiments were conducted with appropriate statistical design.

The experiment conducted to study the effect of four spacings 30x20 cm, 30x30 cm, 45x20 cm, 45x30 cm, three bulb sizes of less than 2.0 cm, 2.0-3.0 cm and more than 3.0 cm and also two depths of planting i.e at 2.5 cm and 6.0 cm respectively on growth, floral and bulb parameters of tuberose cv. Suvasini. It was concluded that treatment combination wider spacing 45x30 cm with bulb size of more than 3.0 cm at 2.5 cm depth of planting was found the best based on several positive results recorded on number of leaves at all growth stages, total chlorophyll content plant\(^{-1}\), spike length, number of florets plant\(^{-1}\), floret length and field vase life and also number of bulbs and bulb lets, bulb size, bulb weight clump\(^{-1}\) and propagation co-efficient. This was followed by Spacing 30x30 cm with bulbs of more than 3.0 cm at 6.0 cm depth of planting. Whereas, spacing 30x20 cm with bulbs of more than 3.0 cm at 6.0 cm depth recorded maximum bulb yield per hectare. Treatment combination spacing 30x30 cm with bulbs of more than 3.0 cm size at 6.0 cm depth of planting was considered to be cost effective and the best treatment combination as it recorded maximum number of spikes per hectare, high net returns and benefit cost ratio.

Based on results obtained from the experiment on effect of inorganic fertilizers RDF (200:150:100 kg NPK ha\(^{-1}\)) at 100% and 50% dose, organic manures viz., Farm yard manure (30 t ha\(^{-1}\)), vermicompost (6.6 t ha\(^{-1}\)), poultry manure (10 t ha\(^{-1}\)), neem cake (5 t ha\(^{-1}\)) applied in combined dose of each at 50% and 25% and also with micronutrient foliar spray of Fe\(_2\)SO\(_4\) and ZnSO\(_4\) @ 2% at 30,60 DAP on growth, floral and bulb parameters of tuberose cv. Suvasini, application of RDF 50% in combination with poultry manure 50% considered as the
The present investigation entitled ‘Integrated orchard management practices for enhanced fruit production in mango cv. Baganpalli under moisture stressed soils of Andhra Pradesh, to study the effect of regulated deficit irrigation and partial root zone drying on yield and quality, role of bio inputs for improved fruit production, effect of paclobutrazol and fruit set improving chemicals on flowering, yield and quality and effect of weather parameters on flowering, yield in mango cv. Baganpalli was carried out at on farm trials of CRIDA during 2013-14 and 2014-15.
The maximum fruit number (139.5 and 129.0), yield per plant (52.9 kg and 50.0 kg), fruit weight (379.0 g and 360.0 g), pulp weight (288.27 g and 274.0 g), per cent pulp (79.38%), pulp to seed ratio (6.74 and 6.85) and least per centage of stone (11.80% and 11.45%) were observed in I_2 (RDI at 100 % Ep) during both the seasons. The maximum total soluble solids (18.50°Brix and 19.0°Brix) and less acidity (0.38% and 0.36%) was noticed with I_4 (RDI 50 % Ep). The maximum total sugars (16.75% and 17.18%) was found with I_6 (PRD at 75% Ep) maximum reducing sugars (5.57% and 5.81%) was noticed in I_5 (PRD at 50% Ep) and the highest non reducing sugars (11.9%) (11.42%) noticed with I_1 and I_6 in 2013-14 and 2014-15 seasons respectively. The highest relative water content (74.95% to 54.04 %) was noticed with I_2 throughout the irrigation period whereas the lowest relative water content was found with I_1 (45.86% to 26.76%). The maximum chlorophyll contents were recorded with I_2.

The maximum fruit number (133 and 131) and yield per plant (70.97 kg and 69.93 kg) were noticed in T_16 (1 kg urea + 1 kg MOP +2 kg SSP) which was at par with T_9 (Azatobacter + Azospirillum + Trichoderma + Phosphate solubilizing bacteria) during both the seasons. The maximum fruit length (15.13 cm and 13.17 cm) and breadth (10.83 cm and 10.23 cm) were observed with T_8 (Azatobacter + Azospirillum + Trichoderma) and the maximum per cent pulp (85.73% and 84.76%), pulp to seed ratio (12.03 and 11.40) and least per centage stone (7.19% and 7.75%) were noticed with T_5 (Azatobacter + Azospirillum). The maximum TSS (19.0°Brix and 19.83°Brix), reducing (5.57% and 5.83%), non reducing (11.59% and 11.60%) and total sugars (17.37% and 17.43%) were noticed with the treatment T_9 and more sugar to acid ratio (41.95 and 48.4) and less acidity (0.43% and 0.38%) was found with T_13 (Trichoderma + Phosphate solubilizing bacteria). The maximum available N (204.25 kg ha\(^{-1}\) and 224.72 kg ha\(^{-1}\)), P (12.92 kg ha\(^{-1}\) and 13.78 kg ha\(^{-1}\)), K (210.51 kg ha\(^{-1}\) and 236.97 kg ha\(^{-1}\)) were noticed with T_16 (1 kg urea + 1 kg MOP +2 kg SSP) followed by T_9. The highest micro nutrients levels were observed with T_9 followed by T_8 during both the seasons.

More panicle length (36.24 and 33.83) was noticed with control, more per cent hermaphrodite flowers (3.49% and 3.20%) and less days to full bloom (96 and 100.17) was noticed with the treatment P_3 (PBZ @ 4 ml m\(^{-1}\)) followed by P_2 (PBZ @ 3 ml m\(^{-1}\)). Maximum number of fruit set per each panicle (17.7 and 15.4) was observed with P_3S_1 (PBZ @ 4 ml m\(^{-1}\) + Spermidine @ 0.02 mM). More fruit number per plant (212.33 and 208.33), yield (88.53 kg and 107.67 kg), maximum fruit weight (625.20 g and 588.53 g), more pulp weight (547.93 g and 493.46 g) and more pulp to seed ratio (16.0 and 18.80) were noticed with P_3S_1 (PBZ @ 4 ml m\(^{-1}\) + NAA@ 25 ppm). The maximum TSS (20.7°Brix and 21.5°Brix), reducing (6.12% and 6.43%), non-reducing (12.38% and 13.17%) and total sugars (18.50% and 19.60%) were noticed with the P_3S_1 which was at par with P_3S_2 (PBZ @ 4 ml m\(^{-1}\) + Borax – 0.6%). The highest chlorophyll contents were found with P_3 over control. The more microbial count was found in untreated soil samples over treated soil samples after 30 days and 60 days of application of paclobutrazol.

Mean maximum temperature was relatively increased by 0.6 °C during 2014-15 season at the experimental site when compared to 2013-14. Mean minimum temperature recorded during December and January of both the seasons was congenial to flowering. At experimental site, Early flowering took place during 2013-14 season (January first week), it may be due to non occurrence of rains during December month of 2013-14 season, whereas during 2014-15 season flowering took place during January last week to February first week (late flowering over first season) due to occurrence of 13.4 mm rainfall during November and December (7.8 mm) months of 2014-15 season. During 2014-15 seasons at Hayathnagar Research Farm, mean maximum temperature relatively increased by 1.1 °C when compared to 2013-14. Early flowering was observed during 2014-15 season (January first week) due to non occurrence of rains during December and very negligible rains during November month of
2014-15 seasons, Whereas during 2013-14, flowering took place during February first week, it may be due to occurrence of rainfall during November month of 2013-14 season. During 2014-15 season at Gungal Research Farm, relatively mean maximum temperature increased by 0.6 °C when compared to 2013-14. With respect to flowering period early flowering occurred during 2014-15 season (January first week) when compared to 2013-14 (January last week to February first week).