

FRUIT RESERACH STATION, SANGAREDDY

AICRP ON FRUITS

Scheme brief information:

- The All India Co-ordinated Research Project on sub-tropical fruits AICRP (STF) on mango and guava scheme was initiated by the ICAR at Fruit Research Station, Sangareddy in the year 1971. The main objective of the scheme is to address major production constraints of Mango and Guava under Telangana agroclimatic conditions. The project focuses on Collection, conservation and evaluation of germplasm of Mango and Guava for its utilization as cultivars or as donor source of desirable traits in hybridisation programme for improvement.
- It further focuses on Standardisation of production technology viz., rootstock development, population density study, nutrition, cropping system, weed control, water management, crop protection techniques, post -harvest management practices of mandate crops.

Mandate crops: Mango, Guava, Avocado and Dragon fruit

Thrust areas: Crop production, Crop Improvement and Crop Protection

Research Accomplishments:

MANGO

Varietal improvement and maintenance of genetic resources:

- Four hundred and seventy seven (477) germplasm is being maintained at Fruit Research Station, Sangareddy.
- A total of **375 mango** varieties have been described as per the international board for plant genetic resources descriptors. A total of 150 mango varieties descriptors were published as Morphological Description of Mango Varieties Under agroclimatic Conditions of Andhra Pradesh (Part-1)

Adaptability of Dashehari in Telangana

- Dashehari fruits weigh 130 g. and is well adapted to Telangana condition with a TSS of 23⁰ Brix. With adaptability and early harvest, Dashehari variety got popularity and is growing across various districts in Telangana and fetches good price to farmers because of high acceptability among consumer.

DASHEHARI-35

- Dashehari-35 is superior variety with 47 per cent higher yield of 324.36 kg/tree than Dashehari local check (220 kg/tree). Fruits can be harvested from 1st fortnight of April with fruit weight of 150-160 g. In addition, Dashehari-35 is moderately resistant to powdery mildew under field conditions.

CROP PRODUCTION/ AGRO-TECHNIQUES:

- Rejuvenation of mango trees of old and senile orchards was standardised. Pruning of mango branches and center opening during June along with application of paclobutrazol during October rejuvenates the tree and increases flowering and improves productivity. Heading back of crowded branches and centre opening with application of paclobutrazol @ 10 g.a.i.tree-1 is recommended for rejuvenation of old and senile mango trees. The technology improved the productivity of mango in coastal districts of Andhra Pradesh by 21 % over existing practices. A number of practical training programmes were given in all the mango growing districts in the two states.
- Soil application of Paclobutrazol (Cultar) @ 3 ml.m⁻¹ canopy diameter at 120 days before bud break (during the month of September increases the yield of mango cv. Banganpalli up to 33%. Application of Paclobutrazol induces earliness in flowering by 30 days. Recommended for mango growing areas where the trees are huge and put forth maximum vegetative growth. The technology has been commercialized by farmers in the Chittoor district of Andhra Pradesh for production of the main season crop. This technology was also innovatively used in the production of off-season mango in Chittoor district of Andhra Pradesh in the National Agricultural Innovation Project (NAIP) entitled "Understanding the mechanism of off- season flowering and fruiting of mango under different environmental conditions".
- Spraying of combination of KH₂PO₄ (1%) + KNO₃ (1 %) during October has initiated the flower bud differentiation in November and increased the yield up to 39 % in mango cv. Banganpalli.
- Application of 1 kg. each of N, P, K in terms of Urea, Single super Phosphate and Muriate of Potash is recommended for 10 years and above aged bearing trees of mango for getting higher yields.
- Integrated nutrient management of mango including application of 250 g of *Azotobacter* along with 50 kg FYM can reduce the RDF (500: 500: 500 g NPK) by 50% besides giving a yield enhancement of 3.53 to 6.14 t/ha and better fruit quality in terms of TSS (18.47 °B) and shelf life (13.97 days) in mango (cv. Banganapalli) at Telangana.
- Soil application of (1000g: 1000g: 1000 g NPK) + 100 g ZnSO₄ + 50 g CuSO₄ + 50g H₃BO in tree trunk basin after harvest along with foliar spray of 0.2% ZnSO₄ + 0.1% CuSO₄ + 0.1% H₃BO₃ (2 sprays, before flowering and marble stage) has improved the yield (14.04 t/ha) over RDF (9.56 t/ha).

CROP PROTECTION

- In Telangana, mango hopper is one of the most destructive pest which accounts for entire loss of crop, if not controlled. Spraying of thiamethoxam @ 0.33 g.l⁻¹ (0.1%) during flowering was found to be effective in controlling mango hopper.

- Powdery mildew of mango attacks mango flower panicles and causes 90% crop damage. A critical temperature of 14.9⁰-37.5⁰ C and relative humidity of above 80% was found highly congenial for the development of powdery mildew disease. The disease can be effectively controlled by spraying wettable sulphur @ 3 g. l⁻¹ before panicle opening or Hexaconazole @ 1ml.l⁻¹ during flowering.
- Pre-harvest spray of Difenconazole 25 EC @ 0.5 ml/lt., 30 days before harvest followed by Post-harvest hot water treatment at 52 ±1°C for 10 minutes could reduce the damage due to anthracnose, shoulder browning, stem end rot and *Aspergillus* rot. Farmers would be benefited by getting better quality fruits free from diseases and thus fetching good market price.
- Oil-based formulation of *Metarhizium anisopliae* is a bio pesticide @ with 0.5 ml/lit sprayed against mango hoppers kept the pest in control which has almost equal effect to chemical insecticide
- Application of Arka Borer Control product slurry on trunk up to 2.5 – 3.0 ft height before the onset of monsoon from ground using a brush reduces 72.34% mango stem borer infestation and also reduces 47.44% of live borer holes.
- Botanical formulations Azadirachtin 10,000 ppm @ 3 ml/l of water followed by Neem soap @ 10g/l of water followed by Pongamia soap @ 10g/l of water followed by AAVYA @ 4 g/l of water gave best results in management of sucking pest complex in mango and the produce will be free from poisonous residues.
- Installation of slow release pheromone @ 20 per hectare catches more number of fruit flies per trap (217) than conventional trap (146 fruit flies/trap). Persistence of slow release pheromone lasts for 73-83 days while conventional lure formulation lasts for 37-47 days.
- A module for management of mango malformation including pruning of diseased branches, burning/disposal of infected material to reduce pathogen inoculum followed by spraying of Copper oxychloride (0.3%) or painting cut end of the stems with Bordeaux mixture, applying Copper Sulphate (50 –100g/plant) post-rainy season and a follow-up spray of Difenconazole (0.05%) 15 days later reduced disease severity to 10%, suppressed gum exudation, dieback and promoted new vegetative growth.

GUAVA:

VARIETAL IMPROVEMENT AND MAINTENANCE OF GENETIC RESOURCES

- About 30 accessions are being maintained in field gene bank. Allahabad safeda and Lucknow-49 were found to be promising in Telangana.

- Breeding work in guava has resulted in development of two hybrids namely Safed Jam (Allahabad safeda X Kohir), and Kohir Safeda (Kohir X Allahabad Safeda) which are prolific bearers

CROP PRODUCTION/ AGRO-TECHNIQUES:

- Application of 500: 200: 500 g. NPK per tree in the month of June-July and spraying of zinc (0.5%) + Boron (0.2%) + Manganese (0.1%) twice during August and October along with organic mulch of 10 cm. thick has increased yield up to 70 % in guava cv. Allahabad Safeda. The technology is recommended to all the guava growing districts. The technology is cost effective with a benefit cost ratio of 3:1.
- Integrated nutrient management in Guava including application of FYM (25 kg/ tree) + Azotobacter (250 g / tree) can save 50% RDF, enhances yield by 1.96 to 4.60 t/ha, besides improvement in fruit weight and fruit quality in terms of TSS, acidity, pulp-seed ratio, vitamin C and shelf life .
- Raised bed cultivation + drip irrigation (80% ER at all stages) + fertigation (75% RDF) + mulching with 100 micron UV stabilize polythene + micronutrient spray (Znso4 and boric acid @ 0.2%) results the higher fruit number (160), fruit weight (200 g) and yield per ha (26.58 t/ha) in guava cv. Allahabad Safeda.
- 75% Recommended dose of Fertilizers + Arka Microbial Consortium (AMC) soil application (5 kg/acre) twice a year along with FYM (June- July and September – October) recorded highest fruit yield (16.39 t/ha) over 100% RDF (13.11 t/ha) in Guava

CROP PROTECTION

- Studies on slow release pheromone formulation for the management of fruit fly in guava(2020 to 2025) revealed that the average number of fruit flies per trap in slow release pheromone is 299 which were significantly superior to conventional lure (171). Persistence of slow release pheromone lasts for 75-85 days while in conventional lure formulation lasts for 35-45days